A METHODOLOGICAL STUDY OF VARIOUS FOLLOW-UP PROCEDURES FOR COMMUNITY COLLEGE VOCATIONAL PROGRAMS

BY

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The problem of this study was to compare and evaluate selected methods of conducting follow-up studies of graduates of community college vocational education. Four methods were chosen for in-depth analysis: mail questionnaires, telephone surveys, personal interviews, and computerized data retrieval systems. Related literature was searched for criteria on which to compare the methods. Five criteria were chosen: costs, response rate, length of time, personnel required, and quality of data. The four methods were then analyzed based on the five criteria. The relationships between the four methods of follow-up were discovered and reported. Interrelationships between the five criteria and the four methods of follow-up were also found. The advantages and disadvantages of each method were analyzed and the subsequent strengths and weaknesses of the methods explored. Consideration was given to each method's ability to collect follow-up data.

The analysis produced suggestions for optimal use of each method. Specific methodological analyses were performed and recommendations made for two common vocational education follow-up needs, studies of vocational education employed graduates and employers of these graduates.

The results indicated that the mail questionnaire method of follow-up was advantageous in obtaining follow-up information concerning socially sensitive subjects. This method was also found to be the most effective in costs and time when dealing with large sample sizes. A major disadvantage of this method was low response rates. Various techniques for improving response rates were reported in the Review of Related Literature.

The telephone survey was found to be advantageous when performing a small, spontaneous study. Costs, time limits, personnel requirements, and sample size were found to be interrelated in the telephone survey. The telephone survey was found to be an acceptable compromise between the mail questionnaire and the personal interview.

The personal interview was found to produce high costs but also procured the highest quality data in relation to complexity and depth of answers. Sample size, geographic dispersion, costs, personnel required, and length of time were found to be interrelated in the personal interview.

The computerized data retrieval system was found to have many advantages: low costs, short time period, and few personnel requirements. However, the type of data that could be collected was limited, and the geographic location of respondents was restricted.

Overall results indicated that for the purpose of follow-up vocational graduates, either a mail questionnaire or a telephone survey would be preferable. The computerized data retrieval system could be utilized for limited data or as a validation procedure. For a follow-up of employers of graduates of vocational education, the personal interview method was found to be preferable to the other three methods for in-depth evaluation. If more general information were desired, the telephone survey and the mail questionnaire could be utilized.

A table was developed from the analysis listing the four methods of follow-up and the five criteria. The strengths and weaknesses of each method were reported for each criterion including sample size and geographic dispersion relationships.

CHAPTER 1

INTRODUCTION

During the 1970's an increasing emphasis on accountability was imposed on educators by legislators and the general public. "Social unrest and dissatisfaction with the social institutions--of which the educational system is only one--have led to the politics of confrontation by which results, rather than promises, are demanded" (Morphet, Johns, & Reller, 1974, p. 542). Legislation intended to accomplish accountability has become common as legislators attempt to determine the results which are being achieved in relationship to moneys appropriated for education (Morphet et al., 1974).

Educational accountability is not easily explained or measured. Williams and Snyder (1974) explained accountability in the following manner:

> Accountability includes evaluation of educational processes and outcomes in terms of stated objectives and communication of findings to educators and the public. The findings from evaluation projects, of course, also provide a base for modifying educational objectives and programs. (p. 40)

Morphet et al. (1974, p. 545) stated that one of the necessary conditions in accountability is that "goals and objectives must be stated in measureable terms." Gleazer (1973, p. 110), when president of the American Association of Junior Colleges (AAJC), stated that accountability is available to vocational programs in the forthright terms of

getting jobs for the people trained, preferably jobs related to their training. Brantner (1975) stated that it is how these vocational education graduates fare in the world of work that is the proper measure of accountability. Kaiserchat (1972) reported that the design of follow-up studies may well be able to answer any existing questions of accountability.

Follow-up, usually considered one aspect of an evaluation system, is designed to obtain data, information, or opinions about or from former participants in the educational process (Headrick, 1977, p. 2). Data frequently sought include length of time between graduation and employment, field of employment, type of work performed, salary, and promotion history. Student evaluations of their programs and training received while attending the college, and employer opinions on the level of training exhibited by their employees who are graduates from the college can also be collected. Information collected through follow-up studies is used to measure the effectiveness of courses, and is essential to systemized evaluation of vocational programs (Headrick, 1977, p. 2).

Employability is an element of vocational education accountability. Many community college leaders are required to supply much of the information needed to answer the questions raised by accountability. Unfortunately, the more information desired, the more difficult and complex becomes the process of obtaining the information. The trade-off in follow-up studies is between the amount of information collected, and the cost and time that can be afforded by an institution for the acquisition process. The more information desired, the more complex

and difficult the information acquisition techniques, necessitating higher costs in institutional resources. In many instances, the acquisition of information deemed necessary is an impossible task due to the lack of cooperation on the part of the population or sample being followed.

Gold and Morris (1977) stated the following observation after working with follow-up studies. "It is almost universally agreed that the task of obtaining follow-up information that is reliable, valid, and useful is a difficult one" (p. 7).

Some of the major limitations associated with the traditional methods of follow-up have been high costs, extended length of time for completion, extensive use of college personnel, low response rate to questionnaires, and uncertain reliability of information (Baugh, 1976; Krueck, 1975; Miner, 1977; Paul, 1976). Some of these limitations are found wholly or partially in every follow-up study.

In 1973, the Virginia Department of Community Colleges began a national review of follow-up studies made by community college personnel of former vocational education students. It was found that the great majority of community college leaders were not satisfied with the follow-up methods they found available (Williams & Snyder, 1974, p. 40). Krisham Paul (1976) reported that researchers "still have not developed adequate measures which would be acceptable to most administrators of vocational education" (p. 1). Therefore, there is an obvious need for better and more feasible methods of follow-up.

The traditional methods of follow-up have been the mail questionnaire and the personal interview. A mail questionnaire study involves

mailing a list of written questions to potential respondents for them to answer and return by mail. A personal interview study involves a person acting as an interviewer, usually going to the potential respondents, verbally asking the questions, and recording the answers on an answer sheet. Jackson and Rothney (1961) made the following statement concerning the need for validation studies on the traditional research methods employed for follow-up:

> The merits, weaknesses, and biases of both the mail questionnaire and the interview have been discussed frequently, but there has been little research designed to assess the comparative contributions to the two procedures for follow-up purposes. (p. 569)

Krisham Paul (1976) agreed that data collection is primarily geared to questionnaire surveys and interviews, and pointed out they both suffer from the problems of nonresponse and inadequate sampling.

The methods of follow-up have been expanded to include two recently employed methods. The first is the telephone survey about which little comparative research has been conducted. The second is the computerized data retrieval system, first utilized by the Florida Community/Junior College Inter-Institutional Research Council (IRC) in 1976.

The telephone survey consists of interviewers calling on the telephone and verbally asking prospective respondents a series of questions. The respondents answer the questions verbally and the interviewer fills in the answers on an answer sheet. This eliminates travel expenses but can bias the sample since not every prospective respondent has a telephone (Weiss & Hatry, 1971, p. 23).

The computerized data retrieval system utilized a new data source for education, the Department of Commerce data file. This method was

used by the IRC to supply information for State of Florida government reports. The IRC obtained a data tape of employment information from the Florida Department of Commerce located in Tallahassee, Florida. The data tape contained pertinent information about salary, weeks worked, and industry code, all classified by social security number (ssn).

The IRC next obtained data tapes from its community college members and the universities of the state of Florida. These data tapes had student information also classified by ssn. The data tapes were then merged by matching ssn. Colleges who sent the ssn of their vocational programs' graduates on their data tapes had the numbers matched to the numbers on the Department of Commerce data tape, and the data corresponding to the matched ssn was extracted from the Department of Commerce tape. The data were then organized and analyzed to perform a vocational education follow-up study.

The research validating the various methods of follow-up is extremely limited. Only a small portion of the research in the area of follow-up surveys has dealt with comparisons of methodology and procedures of follow-up methods, and those studies appear to have serious limitations for utilization (Krueck, 1975, p. 4). Therefore, there appears to be a need for a study which will compare the various methodologies of follow-up, including techniques used to overcome their limitations, to evaluate the usefulness of each method for the benefit of those who wish to employ follow-up studies for the betterment of vocational programs.

Statement of the Problem

The problem of this study was to compare and evaluate selected methods of conducting follow-up studies of graduates of vocational education. These methods included the mail questionnaire, the telephone survey, the personal interview, and the computerized data retrieval system. This study used five criteria to compare the four methodologies previously listed. The advantages and disadvantages of each method were identified and evaluated for appropriate use in conducting follow-up information research. The following five criteria formed the basis of comparison:

1. Cost. The monetary expenditures associated with the methods used to perform a follow-up study.

2. Response rate. The ratio of completed responses to the total number of possible responses, expressed in percentages.

3. Length of time. Estimates of length of time involved in the methods used to perform follow-up studies data collection.

4. Personnel required. The amount of people and their necessary skills and training required to perform the methods of follow-up studies data collection.

5. Quality of data. The accuracy and completeness of the data collected.

Delimitations

The review of related literature for this study was limited to studies reported in the Educational Resources Information Center (ERIC) and the Education Index for the years 1970 to 1978, and available publications in the libraries of the University of Florida and the University of South Florida.

It was not the intent of this study to review the basic fundamentals of follow-up methodologies. Rather, the most recent strategies used in follow-up studies were reviewed to discover the best use of each strategy. Thus, the details of instrument development, preparation, and evaluation procedures were not studied.

Justification of the Study

The addition of efficient and more complete methods of research is an advancement in scientific methods. New and better methods of performing research are always in demand. The gathering of reliable and valid information is a prevalent problem associated with vocational education follow-up studies. In addition to being complex, acquiring reliable and valid information has also been expensive.

Follow-up studies are a type of survey research which are used to obtain information from or about former students of educational institutions. According to Berdie and Anderson (1978) there is a need for systematic study of survey research methods so they can be used correctly and efficiently. This study systematically compared various methods of follow-up and thereby supplemented the literature regarding the utility of follow-up methods for acquiring information essential to community college vocational programs. This study synthesized information concerning the traditional methods of follow-up and the more recently applied methods. They were evaluated and compared to discover the extent to which the more recent methods eliminated or minimized some of the problems associated with traditional methods of follow-up.

Besides conducting a comparison among follow-up methods, this study added to the literature about two recent developments in follow-up

methodologies. One recent method about which limited information is available is the telephone survey. The telephone survey has been employed in a limited capacity and has experienced limited exposure in the literature. Comparisons among the telephone survey and the other methods in the literature are rare.

Another recently employed method with limited literature is the computerized data retrieval system. This method includes a new source of data for educational researchers, the state Department of Commerce data tapes. Since the computerized data retrieval system has only recently been utilized, very little research has been reported regarding its usefulness in educational follow-up studies. This study evaluated the extent of the usefulness of the computerized data retrieval system and its potential as a method of follow-up for community college vocational programs.

These new follow-up methods could provide information vital to community college vocational programs in the areas of government reporting, self studies, and program improvement. Improved methods of information collected could also assist in the advancement of knowledge concerning educational benefits accruing to all students.

Assumptions

An important assumption for this study was that the five criteria chosen by this researcher from a review of the literature were valid for evaluation and comparison of follow-up methods for community college vocational education use.

Definition of Terms

Accountability. The concept that education should be evaluated in terms of stated objectives and goals.

Community college. A two year institution of higher education with programs designed to meet the post secondary education needs of a community.

Computerized data retrieval system. The process of using a computer program to locate necessary stored data, matching related data sets from several sources, and organizing the data into usable information.

Data tape. A magnetic tape that has data stored in the form of magnetic charges, usually containing a multitude of individual records.

Florida Department of Commerce tape. A data tape on which the Florida Department of Commerce has stored employment data of all employed persons in the state of Florida.

Follow-up study. A study conducted to observe the subsequent experiences of students after terminating their enrollment in an educational institution.

Graduate. A recipient of either an Associate of Science degree, Associate of Arts degree, or a certificate of completion from a community college.

Interviewer bias. The respondent's responses are affected by some characteristic or attitude of the interviewer.

Mail questionnaire. A questionnaire mailed out to a population or a sample of a population with a list of questions for people to answer and mail back.

Monetary incentive or inducement. Offering respondents money to respond to a mail questionnaire.

Personal interview. An interview conducted on a one-to-one correspondence with the interviewer in the presence of the person being interviewed. The interviewer asks the questions and records the answers.

Response. A completed questionnaire or interview. Also, a match in the computerized data retrieval system.

Response bias. Those who do not respond to a questionnaire or interview may differ in nonrandom ways from those who do respond, therefore biasing the results.

Telephone survey. An interview conducted over the telephone rather than in the presence of the person being interviewed. An interviewer calls and asks a series of questions. The respondents answer the questionnaire verbally over the phone, and the interviewer records the responses.

Sample. The utilization of only a portion of a population to study the entire population. The sample must be selected in such a way as to meet certain criteria, in order to obtain results generalizable to the total population.

State University System. The collection of nine public universities of the state of Florida.

Vocational education program. An educational program designed to prepare the student for direct entrance into employment, usually at the semi-professional or technical level. The program at a community college is typically one or two years in length.

Procedures

The procedures for this study involved three major phases. The first phase was a review of the related literature of follow-up studies. The second phase was data organization. The third phase was an evaluation of the various methods of follow-up.

Review of Related Literature

The review of related literature involved the study of four methods of follow-up: the mail questionnaire, the telephone survey, the personal interview, and the computerized data retrieval system. A brief description of each method was reported. Information concerning costs, response rate, length of time, personnel required, and quality of data, relating to the four methods was obtained and reported. Suggestions for improvement of follow-up studies presented in the literature were also reported.

Data Organization

Once the review of literature was completed, the required information concerning the five evaluative criteria was organized to facilitate comparison among the various follow-up methods.

Evaluation

The costs, response rate, length of time, personnel required, and quality of data were compared across the four follow-up methods. Each method was then evaluated in terms of strengths and weaknesses. Recommendations were made regarding the most beneficial use of each method for vocational education follow-up.

Organization of the Research Report

This study is reported in four chapters. The first chapter includes the background and rationale of the study, statement of the problem, delimitations, justification of the study, assumptions, definitions of terms, and procedures. Chapter two presents the review of the related literature, which includes a qualitative review of the four methods of follow-up and a review of literature concerning the five evaluative criteria to be associated with each method. Chapter three continues a discussion of the four methods of follow-up and a comparison of the four follow-up methods relative to the five evaluative criteria. Chapter four draws conclusions for follow-up studies as well as implications for further research.

CHAPTER 2

REVIEW OF RELATED LITERATURE

Introduction

A review of the literature demonstrated that educational surveys and follow-up studies in particular are a recent development in higher education. "The American survey of higher education, which is largely a product of the twentieth century, is only one section of the broader field of educational surveys in general" (Eells, 1937, p. 15). This statement was made by Walter Crosby Eells, professor of education at Stanford University, in his 1937 book, Surveys of American Higher Education. The book was written as a comprehensive study and evaluation of the survey reports that had been published up to that time. At no point did the author mention follow-up studies, for at that time, no studies existed.

Junior and community colleges were created early in the twentieth century and began to expand to include vocational education at the post secondary level during the 1920's and through the 1940's (Hillway, 1958, p. 6). It was in this area of education that the scope of evaluation was first broadened to include the follow-up of program completors (Headrick, 1977, p. 2). The follow-up study has continued to develop

and expand along with vocational education and junior and community colleges, whose growth increased tremendously during the years 1960 through 1975 (Jennings, 1975, p. 29). With the era of accountability in the 1970's, follow-up studies were increasingly used for justification for public funds spent on vocational programs (Headrick, 1977, p. 3; Williams & Snyder, 1974, p. 40).

Accountability includes evaluation of educational processes and outcomes in terms of stated educational objectives, and the communication of these findings to educators and the public (Williams & Snyder, 1974, p. 40). Because vocational education programs are relatively new in higher education, it is considerably more difficult to develop an accountability strategy for them than for traditional college programs, which evaluate themselves in terms of degrees produced and academic honors (Williams & Snyder, 1974, p. 40).

The need to gather accountability information for vocational education programs was filled by the follow-up study. Originally, follow-up procedures were employed in vocational education as a segregated process, with little or no regard for integration with formal evaluation or management plans (Headrick, 1977, p. 2). This restrictive approach toward follow-up procedures has been in rapid decline as educators become increasingly aware of the need for comprehensive management and systemized evaluation programs (Headrick, 1977, p. 2).

McKinney and Oglesby (1971) stated a very general definition which covers all types of follow-up studies. They stated that a follow-up study was "a procedure for accumulating pertinent data from or about individuals after they have had similar or comparable experiences" (p. 7).

There are various reasons for performing a follow-up study and collecting pertinent information. Headrick (1977) listed four purposes for performing a follow-up study:

1. To improve programs;
2. To provide a basis for accountability;
3. To aid in planning; and
4. To aid in decision making. (p. 3)

The Southern Regional Education Board (SREB) agreed with Headrick that a college conducts a follow-up study for a variety of reasons. Basically, however, according to the SREB, the main reason a college or university conducts a follow-up study is to assess how well it has met its objectives (SREB, 1978, p. 1). How well the objectives are being met, which is the effectiveness of an educational program, is important, but Brantner (1975) pointed out that before these can be measured, the results must be observable.

The first objective of the follow-up study is to report the results of the educational programs by observing how the graduates fare in the world of work. Once the results have been reported, then the evaluation can be performed on the information gathered. Evaluation should be done only on true and accurate results. Therein lies the importance of the follow-up study, to gather reliable, accurate, and pertinent information about the results of educational programs, and evaluate and report on these results.

Follow-up studies for vocational programs are usually quite clear on the type of information they wish to gather because vocational education is well defined. Vocational education is any program whose major

goal is that the student shall attain gainful employment after a course of study requiring no longer than two years for completion (Cohen, 1971, p. 137). With the major goal of vocational education so clearly defined as gainful employment, most vocational follow-up studies concentrate on employment information of their graduates.

Krisham Paul (1976) listed three questions for which most vocational follow-up studies might seek answers.

1. What happens to the youths and adults who, after completion of their training, try to find work rather than continue schooling?

2. Are there significant differences between the job-related experiences of persons who complete vocational education programs and those who do not?

3. Do the vocational education programs justify their costs? (p. 6)

Most of the vocational follow-up studies that are reported in the literature have focused on the first question concerning the experiences of graduates who seek employment. Information on comparison of vocational graduates to nongraduates is difficult to collect and the question of vocational programs justifying their costs involves a value judgement.

The SREB stated that traditional follow-up procedures make the assumption that the graduate's own perception of how well the institution has fulfilled its objectives is one way of assessing the attainment of program objectives (SREB, 1978, p. 2). Other methods of assessment that can be used are scores on graduate record exams and competency tests. Nevertheless, the major focus of most vocational programs' follow-up studies stresses the opinion of the graduates and concentrates on gathering information from them (SREB, 1978, p. 2).

There are three methods of follow-up customarily used and all of them concentrate on gathering information from graduates. These are the mail questionnaire, the telephone survey, and the personal interview (Denton, Ash, Brown, Dowell, Gutcher, Hoyle & Swinney, 1977). These methods all depend on a question and answer format. The questions depend on the type of information desired and the purpose of the follow-up study. The Southern Regional Education Board has published a manual of procedures and common core questions for follow-up studies of vocational programs of two year institutions (1978). The manual includes criteria for the selection of follow-up questions and recommends that an institution add questions that are tailored to its own needs while using the suggested core questions for inter-institutional comparisons (see appendix).

The most frequently used method of follow-up is the mail questionnaire. It will be explored and reported on first, followed by the telephone survey and the personal interview. Last to be reported on will be the computerized data retrieval system.

Mail Questionnaire

Champion and Sear (1969) reported that the mail questionnaire has been used for more than 40 years (p. 335). It has been used extensively in many areas of social research and has been the most frequent method employed with educational follow-up studies (McKinney & Oglesby, 1971, p. 9).

The mail questionnaire procedure involves the mailing of a written list of questions, called a questionnaire, to potential respondents.

The respondents then answer the questions by writing on the questionnaire, and mail it back.

The mail questionnaire has many advantages over the other survey methods. It is generally agreed that the mail questionnaire is the least expensive method of conducting a survey of a large sample or population (Berdie & Anderson, 1974, p. 17). Compared with the second most popular method of data collection, the personal interview, the mail questionnaire has the following three major advantages:

1. If its questions aim at situations or decisions which concern the entire household, rather than one individual, then the mail questionnaire will offer the advantage of opportunity for consultation within the family; the personal interviewer rarely has a chance to obtain a "family interview."

2. More important, unavailability is sometimes a serious handicap for the personal interviewer.

3. Third, its impersonality often prompts different shading to the replies than those obtained when the respondent is part of the psychological situation of being questioned by another person. For some types of questions, the mail responses are probably more specifically candid. (Franzen & Lazarsfeld, 1945, p. 294).

Benson (1946) stated that "in mail surveys there is no chance of an interviewer intentionally or unintentionally, biasing the answers" (p. 234). These are reasons why the mail questionnaire has become the most widely employed method of follow-up. But, as with the other methods of information acquisition, the mail questionnaire has its disadvantages.

The mail questionnaire survey procedure will be reviewed using the five variables previously chosen to compare and evaluate the various follow-up methods. These variables are costs, response rate, length of time, personnel required, and quality of data. A review of related

literature found a substantial amount of written material concerning certain variables, while other variables were scarcely mentioned. Therefore, information on each variable needed for later comparison is reported, with those variables being of major interest to past researchers having a greater quantity of research to report.

Costs

Costs for mail questionnaires were difficult to isolate and compare across studies. Different studies included different types of costs, incurred in different years, and utilizing different techniques. The variety of methods utilized to increase response rate made comparison of costs across studies very complicated. Therefore, costs will first be reported for various individual questionnaire studies, followed by comparison studies and cost effectiveness studies.

The SREB reported that costs of follow-up surveys vary widely, depending primarily on whether or not staff costs were included. The National Center for Higher Education Management Systems (NCHEMS) estimated materials and mailing costs range from 17¢ to 26¢ per student contact (as contrasted with student response) for nonprofit bulk and first class rate mailing, respectively. This included only one mailing (SREB, 1978, p. 23).

The University of North Carolina (Chapel Hill) reported costs of 35.6¢ and 41.5¢ per student contact for surveys performed in 1976 and 1977, respectively. These amounts included only one mailing, first class, as well as staff costs in processing, survey preparation, and mailing. They did not include costs for analyzing responses and preparing a report (SREB, 1978, pp. 23-24).

The University of Illinois reported costs of $1.86 and $1.50 per student contact of 1972 and 1973 graduates, respectively. These costs included three mailings and costs for staff, computer time, evaluation and reporting (SREB, 1978, p. 24).

Navarro College, a two year institution in Texas, monitored follow-up questionnaires and costs for six institutions while helping in the development of the Texas Information System. The college reported that staff costs accounted for 70% of total follow-up costs. For mailed follow-up questionnaires, with response processed by computer, the per student cost was calculated to be $3.27, including 70% staff costs. Three and four mailings were included in the follow-up studies (SREB, 1978, p. 24).

Student contact was based on the number of questionnaires delivered. Response rate refers to the percentage of questionnaires returned, a more practical figure to use when evaluating costs. Increasing response rate is important to researchers and the cost rise according to the attempts and techniques used to increase the response rate. Therefore, costs should be associated with response rate to show a more accurate indication of how much can be spent to increase the return of questionnaires.

Hochstim and Athanasopoulos (1970) reported a mail questionnaire study performed in 1965. The total costs for the study were $37,000 for 5,630 returned questionnaires, a 70% response rate. The cost per response was calculated by dividing the total cost by the number of returned questionnaires to obtain a cost of $6.55 per questionnaire returned. Since researchers are clearly interested in returned questionnaires, cost related to returned questionnaires is a more meaningful

figure than cost per student contact. The latter does not take into consideration the response rate of the study.

Weiss and Hatry in their book, An Introduction to Sample Surveys for Government Managers (1971), listed some cost ranges based on survey experiences, and included other cost information that could be synthesized. They broke down the costs to the various components of a mail questionnaire and listed them as seen in Table 1. These cost estimates were based on 1971 cost figures. Both a second mailing of the questionnaire and telephone calls to nonrespondents were used to increase response rate. Also included was a sampling of nonrespondents to test for response bias, since just over 50% response rate was achieved. Their estimate for the cost of the mailed questionnaire was $8.10 per response.

Krueck (1975) reported a study where he compared the results of three alternative methods of follow-up with the purpose of examining the rate of response, costs, and nature of the response. Krueck divided the costs into two sections, fixed costs and treatment costs. Fixed costs were costs that applied commonly to all three treatments such as printing and processing. Treatment costs varied depending on the procedure employed.

In Krueck's study, the mail questionnaires' initial response rate was 37.4% of all mail questionnaires. A telephone call to remind potential respondents increased the response to 42.7%. A second telephone reminder brought an additional 7.3% for a total of 50.6% response. A total of 164 questionnaires was initially mailed out at a cost of 16¢ each, including a self-addressed, stamped return envelope. Seventeen additional questionnaires were mailed after telephone reminder

Table 1

Cost Estimates For Mail Questionnaire

	For 2,000 questionnaires mailed
1. Overall planning and direction	-
2. Preparing listing	$ 1,500
3. Selecting sample, addressing labels	750
4. Developing questionnaire (including conferences and 30 pretest interviews)	600
5. Printing questionnaires, cover letter, return envelopes, supplies	1,000
6. Interviewing	
a. Telephone follow-ups to nonreturners (approximately 1,200)	1,200
b. Interviews with 50 nonreturners (to check whether they differ from questionnaire returners	
(1) by telephone (approximately 30)	300
(2) in person (approximately 20)	350
7. Editing, coding, punching, tabulating about 1,000 returned questionnaires	1,200
8. Telephoning	300
9. Mailing, including one mail follow-up to nonreturners (approximately 1,500)	875
10. Analyzing data and report writing	300
11. Reproducing report	100
Total	$ 8,475
Average cost of the estimated 1,050 responses	$8.10

Note. From An Introduction to Sample Surveys for Government Managers, by C. H. Weiss & H. P. Hatry. Washington, D. C.; Urban Institute, 1971, p. 46.

calls. Thus, $27.60 was expended for the mailing of questionnaires. The work involved 46 manhours for a total cost of $165.60. Therefore, the cost per response was approximately $2.00. Krueck (1975) found this procedure to be the least expensive of the three procedures.

Dillman (1972) performed large mail surveys in 1970 and 1971. The costs were approximately the same both years. Direct costs for postage, paper and printing of the questionnaires, envelopes, and cover letters, amounted to 68¢ per completed questionnaire. Labor costs were figured at the rate of $2.00 per hour and added to direct costs bringing the total cost per response to $1.46 (p. 257).

Wotruba (1966) investigated the effects of monetary inducement and no inducement on the percentage and completeness of responses to a mailed questionnaire. He performed a pretest to ascertain how many questionnaries needed to be mailed with 25¢ included, a promise of 50¢, or no monetary inducement, to obtain a return of 750 questionnaires. The pretest results demonstrated that with a 25¢ monetary inducement, 1,875 questionnaires would have to be sent out to obtain 750 completed questionnaires. With a promise of 50¢, 3,750 questionnaires would need to be sent out, and if no monetary inducement was included, 4,167 questionnaires would need to be sent out. Wotruba's results showed that the approach using the 25¢ inducement would incur the least expense when completeness of responses (all questions answered) was important. If completeness was not important, the approach with no inducement was least expensive. Table 2 presents a comparison of costs between the three inducement alternatives. Second mailings to compensate for incomplete questionnaires were included.

Table 2

Comparison of Major Study Costs Using Different Monetary Inducements

	25¢ sent	50¢ promised	No inducement
Expected percent response	40	20	18
Necessary to mail	1875	3750	4167
Costs:			
Postage out (@ 5¢)	93.75	187.50	208.35
Materials, printing, addressing, stuffing (est. @ 15¢)	281.25	562.50	625.05
Return postage (750 @ 7¢)	52.50	52.50	52.50
Inducement	469.00	412.50	0.00
	(25 x 1875)	((50¢ + 5¢ postage) x 750)	
Total costs without considering completeness	896.50	1,215.00	885.90
Percentage of incomplete replies	5	30	22
Additional necessary to mail	94	1125	917
	(1875 x .05)	(3750 x .30)	(4167 x .22)
Costs:			
Postage out (@ 5¢)	3.70	56.25	45.85
Materials, etc. (est. @ 15¢)	14.10	168.75	137.55
Return postage	2.66	15.75	11.55
	(38 x 7¢)	(225 x 7¢)	(165 x 7¢)
Inducement	23.50	123.75	0.00
Total costs for additional completed responses	44.96	364.50	194.95
Total costs for all completed responses	941.46	1,579.50	1,080.85

Note. From "Monetary Inducements and Mail Questionnaire Response" by T. R. Wotruba, Journal of Marketing Research, 1966, 3, p. 399.

Ronald Baugh (1976) performed a follow-up cost study which compared the cost of mail questionnaires to personal interviews, as well as manual versus computer analysis of follow-up results. The results of Baugh's study can be seen in Table 3. A comparison showed the personal interview costs to be 3 1/2 times more expensive. The cost for a mail questionnaire with computer processing was $8.20 per response and for manual processing was $4.85 per response.

Baugh (1976) concluded that there must be some optimum number of responses where manual processing is less expensive than computer processing, however; above the optimum number of responses, computer processing would be less expensive than manual (p. 10). He also reported that mailing bulk rate did not save money due to the use of personnel to sort and bundle the bulk mail.

Christison (1977) performed a cost effectiveness study for follow-up questionnaires with various methods to increase response rate. He concluded that a reminder phone call, a second copy of the cover letter and questionnaire, and prior contact by phone before mailing the instrument were all cost effective. High cost and high returns were associated with offering several dollars as monetary reward. Least expensive, but with low return, was a single mailing of the cover letter and questionnaire with no further contacts. The costs associated with Christison's study are listed in Table 4.

Erdos (1974) stated that low overall costs result in more flexibility per dollar spent for the mail questionnaire. The combined costs of mailing, postage, and incentives offered are usually less than hiring staff for personal contacts. Because of this difference in expense,

Table 3

Costs for Mail Questionnaires and Personal Interviews

Mail Questionnaire	Contacts		Total Cost per	
	Attempts	Responses	Attempts	Responses
Computer processing	14,234	7,780	4.482	8.201
Manual processing	227	125	2.672	4.852
Personal interview				
Computer processing	271	271	28.672	28.672
Manual processing	0	0	0	0

Note. From "Follow-up Cost Study" by R. C. Baugh, Forth Worth, Texas, Tarrant County Junior College, 1976, p. 26.

Table 4

Christison's Cost Effectiveness Study Results

Methods to increase response rate	Base Costs	Special Costs	Total Costs	Response rates
Base group, no treatment	$ 21.75	$ 0	$ 21.75	38%
Postcard follow-up	21.75	8.85	30.60	50%
Second letter and instrument follow-up	21.75	12.85	34.68	58%
Telephone follow-up	21.75	6.00	27.75	58%
Paying $2.00 for returning instrument	21.75	42.00	63.75	65%
Telephone ahead	21.75	30.00	51.75	68%
Paying $3.00 for returning instrument	21.75	84.00	105.75	73%

Note. "Alternative Methods of Improving the Return of Follow-up Questionnaires: Their Costs and Effectiveness," by M. Christison, 1977, p. 11.

one could afford to produce a large number of completed questionnaires by using the mail method (p. 2-91).

When looking at costs of mail questionnaires in relation to the personal interview, most researchers agreed that the mail questionnaire costs less than the personal interview (Benson, 1946, p. 234). Berdie and Anderson (1974) concurred with the above statement. They stated, "the expense of printing questionnaires and distributing them to large numbers of people is considerably less than that of interviewing similar numbers of people" (p. 17). Gordon (1975) agreed, summarizing the advantage of the mail questionnaire as being its economy (p. 77).

Response Rate

Kerlinger (1973) stated that the mail questionnaire has serious drawbacks, the primary defect being lack of response, or not enough questionnaires being completed and returned. Most researchers criticized the mail questionnaire basically for the low response frequently encountered and for the ease of misinterpretation. Mildred Parten (1950) went so far as to describe mail questionnaires as almost invariably open to question (p. 400). As stated by Hackler and Bourgette (1973) the problem with response rates was that those who did not respond might differ in nonrandom ways from those who did respond (p. 276). This brings response bias into the questionnaire results. Investigators who have supported the notion of bias produced by nonresponse were listed by Leslie (1972) as Rothney and Mooren, 1952, Bennett and Hill, 1964, Anastasiow, 1964, Norman, 1948, Suchman and McCandless, 1940, and Pucel, Nelson, and Wheeler, 1971. Leslie (1972) questioned those researchers and their common view that low response necessarily biases the results.

According to Leslie (1972), the studies that have dominated the theory of response bias are based primarily on the late 1940's and early 1950's studies. He concluded:

> The evidence of bias in these studies, however, was in most cases the demonstration that demographic traits of the respondents, differed from non--or late respondents. Differences between respondents and non--or late respondents, according to answers to substantive questions posed, were not usually shown. (p. 327)

Leslie (1972) developed the following generalization to counteract the prevalent view that response bias severely limited the usefulness of surveys and questionnaires which did not have 100% return:

> 1. There is ample evidence that response rate bias may occur in mail surveys. However, much of the available evidence reveals only differences between respondents and nonrespondents or late respondents in terms of such independent variables as sex, geography, age, etc. It is often assumed that these differences lead to differences between respondents and nonrespondents on the dependent variables, i.e., the questions under study.
>
> 2. When populations surveyed are homogeneous (having a common group identity), minor differences on independent variables between respondents and nonrespondents or late respondents may occur, but differences as to dependent variables are unlikely. (p. 328)

Leslie's (1972) conclusion was that researchers surveying issues directly related to homogeneous groups should not be overly concerned about the percentage of questionnaire returns, just that enough responses are gained to meet statistical assumptions. Benson (1946) said something similar to Leslie's conclusion. Benson stated:

> If the segment of the population to be surveyed is homogeneous, the differences in tastes or opinions within that group are much more restricted. Therefore, in a mail survey, results for returns, from a small proportion of such a group would tend to be more like the whole than is the case when tastes or opinions within the group to be sampled are very different. (p. 237)

Many researchers still consider response bias the primary weakness of the mail questionnaire. Wallace (1954) stated:

> There is present in the response to any mail questionnaire an important number of persons . . . who reply to most of the mail questionnaires they receive. These persons have higher education and, very probably, certain other distinctive characteristics. (p. 51)

Berdie and Anderson (1974) reported that many researchers have found that nonrespondents are usually the least educated members of the sample (p. 52). Baur (1947-48) compared early to late respondents and found that the less educated and the married respondents were underrepresented in the early returns, and overrepresented in the last returns.

Hochstim and Athanasopoulos (1970) performed a study on mail questionnaire response bias by using personal interviews for follow-up on nonrespondents. They found a slight response bias (p. 74). Personal contact to retrieve the questionnaires by personally interviewing the nonrespondents tended to improve estimates associated with low socioeconomic studies, since this stratum was least likely to respond by mail. It also introduced some not-at-home bias characteristic of personal interview surveys. This caused the final sample to be slightly overweighted with large families and women.

Hochstim and Athanasopoulos (1970) found the largest difference between the mailed response and total response after personal contact to nonresponses occurred in two categories:

> 1. Group activities -- people who reported no organizational membership and those who indicated no political activity were less likely than others to respond by mail.
>
> 2. Socioeconomic characteristics -- a similar tendency was shown by people with low education, job security, and without provision for medical care. (p. 77)

Hochstim and Anthanasopoulos (1970) made the following tentative observation:

> Surveys conducted entirely by mail can achieve a good representation of the universe. When parameters are not known, careful evaluation should be made of differences in response to substantive data by various socioeconomic and other relevant groups in the sample to see whether a bias in the total return would exist if such groups were over -- or underreported. (p. 81)

Other studies have suggested that response bias is not slight but can be substantial. Weiss and Hatry (1971) reported that people with extreme views are more apt to respond to questionnaires than people with moderate views. They also reported that older and less educated people as well as women respond less frequently to mail questionnaires. These differences between respondents and nonrespondents would certainly cause a response bias. Most researchers still regard the low response rate of questionnaires as the major drawback of the mail questionnaire in survey and follow-up research.

To avoid the problems of response bias, the Advertising Research Foundation recommended an 80% or better response rate for mail questionnaire surveys (Erdos, 1974, p. 2-102). They stated that this would bring the rate of nonresponse into line with the rate of substitution in well-conducted personal interview studies (p. 2-102). To be confident of an unbaised representation, Kerlinger (1973) stated that "every effort should be made to obtain returns of at least 80 to 90 percent or more, and lacking such returns, to learn something of the characteristics of the nonrespondents" (p. 414).

The SREB suggested a check for nonresponse bias when response is not as high as desired. The SREB reported several ways in which

nonresponse bias may be determined without tremendous expenditure of resources.

> The most direct check is to select a limited random sample among the non-respondents for telephone interviews in order to obtain responses from some non-respondents and then to determine whether their responses follow the same pattern as from the respondents. Often in such telephone interviewing, the length of call can be reduced by asking selected questions instead of the entire series of the survey form. A statistical test (such as the chi-square test) is then used to determine whether there is a significant difference between the survey responses from respondents and non-respondents. A "sequential non-respondent sampling" telephone technique, that takes the place of a statistical test, has been used in Maryland in conjunction with a state-wide survey of community college students. This sequential sample technique essentially sets an arbitrary range of tolerance variation around the results obtained on any one question from the respondents. Cumulative results from the responses to a question from telephoned non-respondents are computed until this response result stabilizes (perhaps after 30-50 calls). If the stabilized cumulative response result from the non-respondents falls within the variation tolerance previously established, then the respondents' and non-respondents' responses are considered essentially the same. (p. 28)

Another way for checking for nonresponse bias was to use demographic characteristics.

> If the demographic characteristics for respondents and the total population in the survey are essentially the same, then the inference can be made that the responses are representative of the total population, at least on the basis of their demographic characteristics. In order to check for demographic differences between respondents and the total population, demograhic averages on various characteristics are computed for the respondents, and then compared to those for the total population. A chi-square test is applied to check whether the resulting differences are significant. (pp. 29-30)

If the demographic characteristics of the respondents and the total population differ, further checks should be made using substantive questions compared by sex, race, grade point average, or other variables.

The last way to check for response bias suggested by the SREB was to check for differences between early and late respondents.

> The inference is sometimes made that since non-respondents might have more in common with late respondents than with early respondents, therefore, if the responses from late respondents significantly differ from those given by early respondents, this might indicate non-respondents' bias. In order to use this method to check for non-response bias it is necessary to number responses sequentially as they arrive. Survey results might then be compared for those graduates that were among the first one-third to reply. If responses are not significant different, the assumption is made that the non-respondents would also not be significantly different. (pp. 30-31)

Baur (1947-48) performed a study using a questionnaire to survey veterans on their plans for education and training after leaving the service. To analyze the amount of response bias, his sample was divided into five groups according to the number of days that elapsed between the original mailing date and receipt of the questionnaire. Baur found that the greatest bias was introduced by differences in interest in the subject of the questionnaire. Those without definite plans for education or training were underrepresented in the early returns and overrepresented in the late returns. Therefore, he concluded that the smaller the proportion of returns in a mail questionnaire on a subject of interest to only a part of the sample, the greater the bias attributed to differences in the subject. Baur also found that the less educated and the married respondents were underestimated in the early returns and overrepresented in the late returns.

Nielsen, Moos, and Lee (1978) performed an extensive mail questionnaire follow-up study on college students from their freshman to senior year. They found significant differences between early and late respondents on nearly a dozen variables. They stated that their results

indicated that researchers cannot account for follow-up nonresponse bias by making statistical adjustments according to data available at initial testing. They suggested more study needs to be done to develop categories of nonresponders who may be motivated to cooperate by different types of follow-up techniques.

Many researchers with low response rates preferred to make extra efforts to have more questionnaires returned to increase the accuracy of their study, but these extra efforts increased the costs of follow-up studies (Weiss & Hatry, 1971, p. 23). Hochstim and Athanasopoulos (1970) performed a mail questionnaire study in which the initially returned questionnaire cost $6.55 per questionnaire. A personal interview follow-up of nonrespondents to the mailed questionnaire increased the rate of response, but the additional questionnaires filled out during personal interviews cost $13.64 each.

Bower and Renkiewicz (1977) reported that extra efforts did increase response rates in mail questionnaires and encouraged researchers to use them. Researchers have investigated a wide range of variables in trying to increase the response rate for mail questionnaires. Among the variables were monetary incentive, first class versus third class mailing, stamped versus business reply envelopes, advance letters, personal versus nonpersonal wording of the cover letter, timing of the questionnaire and follow-up mailings, length of the questionnaire, repeated mailings, and intrinsic interest.

Monetary incentive. Hackler and Bourgette (1973) applied a theory of dissonance to mail questionnaire response. They theorized that sending

a dollar to potential respondents along with a questionnaire would cause the respondents to feel cheap if they kept the dollar and did not return the questionnaire, therefore causing internal dissonance. According to Hackler and Bourgette, the dollar was not a great enough reward to justify the mildly improper behavior of not returning the questionnaire. Therefore, to reduce the dissonance felt by the respondents by not returning the questionnaire or the dollar, the respondents would return the questionnaire.

Hackler and Bourgette (1973) sent one group a dollar with the questionnaire and the other group received the questionnaire without the dollar. They expected those who received the dollar would experience dissonance, and to reduce their dissonance, would return the questionnaire. Their results confirmed their expectations. The dollar group returned 71% of the questionnaires compared with 39% return with the nondollar group. When the nondollar group was later sent a dollar, their response increased.

Huck and Gleason (1974) also performed an experiment utilizing monetary incentive to increase response rate. They used four different groups. The first group received a quarter on the first mail out, the second group received a quarter on the second mail out, the third group received a quarter on the third mail out, and the fourth group was the control group, receiving no quarter with three mail outs. Huck and Gleason's results were that on the first mail out the group receiving the quarter had a return of 78% with the other three groups only receiving a return of 50%. The difference was significant. After the second mailing, with the second group receiving the quarter, both the

first and second groups were significantly higher in responses than the third and fourth groups. The same was true for the third mail out. Therefore, Huck and Gleason recommended sending a monetary incentive with the second mail out to get the highest response for the least cost.

Wotruba (1966) performed a study to investigate the effects of two types of monetary reward or inducements, and no inducement, on the percentage and completeness of response to a mail questionnaire. His results were that sending a monetary inducement with the questionnaire produced a better return of the completed questionnaire. There was no significant difference between the promise to send a monetary inducement and no inducement at all. Wotruba concluded that the value of an immediate inducement seemed to be stronger than the monetary value of a delayed inducement, as long as the immediate inducement was not unreasonably small. He also concluded that when completeness was considered, the desired number of responses was obtained with least overall cost using the immediate inducement. If completeness of the questionnaire was disregarded, the no inducement approach was least expensive.

Kephart and Bressler (1958) reported that the inclusion of a quarter with a questionnaire could augment or even create another response bias among the receivers. They suggested that before researchers include a monetary inducement into their survey, they should consider that it is quite possible that people who are influenced by a quarter or by any other type of inducement may differ from those who are not so influenced.

Wiseman (1973) performed a study involving four variables. His results were that a 10¢ monetary incentive and a post card reminder

improved response rate by 8%. Wiseman also offered to return survey results but found this had a slightly negative effect on response. The overall results were that respondents given a 10¢ monetary incentive, a post card reminder, and a stamped return envelope demonstrated the highest response.

First class versus third class mailing. Gullahorn and Gullahorn (1963) noted that first class mailing of a questionnaire elicited a somewhat higher return than third class mailing (p. 294). Warwick and Lininger (1975) agreed that higher returns were noted when questionnaires were sent out first class mail rather than third class mail (p. 131). The SREB supported this finding: "First class mail is more personal and also has the advantage that the post office will forward such mail to a forwarding address, which is not done for bulk rate mailing" (p. 22). But, the SREB stated, bulk rates cost considerably less than first class rates. The SREB made the following recommendation:

> On a bulk rate mailing envelope, stamp the message, "Return Postage Guaranteed." If the addressee is not at the address, the letter will be returned to the sender with the reason for nondelivery. The sender pays a 45¢ charge for this service. Re-address the letter and send it out first class this time, and now the post office will forward it to a forwarding address, if the post office has one. (pp. 22-23)

Return envelopes. In regard to return envelopes, Gullahorn and Gullahorn (1963) reported that more questionnaires with stamped return envelopes were returned than with business reply envelopes. In Wiseman's 1973 study, the stamped return envelopes produced a 13% increase in response rate. Champion and Sear (1969) found that response rates were greater when regular stamped envelopes and special delivery postage

were used. Selgas (1977), using cover letters, stamped addressed return envelopes, and two mailings obtained a 70% response rate with his mail questionnaire. Warwick and Lininger (1975) also reported that stamped, addressed, return envelopes, rather than conventional business reply envelopes, were one of the more effective devices to increase response rate (p. 131).

Advance letter. McKinney and Oglesby (1971) suggested the use of an advance letter to be mailed out before the questionnaire. This advance letter or "alert card" informed the student that an important questionnaire was soon to arrive and their cooperation in filling it out and returning it was vital.

Ford (1967) performed a study observing the effects of an advance letter on response rates, quickness of return, completeness of the responses, and the accuracy of the responses. His study demonstrated a significant increase in the rate of return with the use of an advance letter, but did not find a significant effect with the other three factors. Erdos (1974) also reported that the use of an advance notice sent prior to the questionnaire improved returns of the questionnaire (p. 2-100).

Parsons and Medford (1972) stated that "previous studies of advance notice in mail questionnaire surveys have shown significant improvement in response rates" (p. 258). They suggested that when the sample is drawn from a fairly homogeneous population, the advance notice does not always improve the response rate. They conducted two experiments where one group of a homogeneous sample received advanced notice of the upcoming questionnaire and the other group of the sample

received no advance notice. They found in both experiments there was no significant increase in response with the advance notice group. They suggested their findings indicated that advance notice was not necessary when the sample was from a fairly homogeneous population.

Cover letter. An important part of most mail questionnaires was the accompanying cover letter. Berdie and Anderson (1974) stated that the cover letter should be short and to the point (p. 59). According to the SREB (1978), the letter set the tone for the message from the institution to the students. The president's signature on the cover letter increased its importance in the view of the student. The cover letter should also stress the confidentiality of the student's response and emphasize the value of the individual student's evaluation of the institution. Francel (1966), a professional survey conductor, stated the most important feature of a cover letter should be its friendly, personal tone. He also reported an action phrase, such as "Won't you do it now while you're thinking about it" and stressing the importance of the individual respondent's opinion would have a positive effect on the response rate.

Various studies have found that a personally worded and typed cover letter did elicit a higher response rate. Edwin Carpenter (1974-75) did a study involving different levels of personalization. He came to the conclusion that reducing personalization would reduce response. If the response to the questionnaire was high, in this case 70% or better, then the difference in response rate would not be substantial, but at lower levels of response rate, the difference would be substantial.

Arnold Linsky's (1965) experiments consisted of four factors and their effect on response rate. He found that personalization and emphasizing the importance of the respondent (the person who receives the questionnaire) had a significant positive effect on the response rate. Emphasizing social utility and an appeal to help the researchers had no effect on the response rate. Champion and Sear (1969) confirmed Linsky's results in that they found that response rate would be greater when the respondent's importance to the study was emphasized.

Frazier and Bird (1958) tested the use of a handwritten postscript for increasing response rate. The postscript read "P.S. We need your help in this report. Could you please send it in promptly?" They found a 27% increase in response with the addition of the handwritten postscript (p. 187).

Other researchers suggested that personalizing a cover letter does not have as much effect on response as it has been given credit. Andreasen (1970) stated that most researchers assume the effect of personalization is positive on response rate. He reported that many cover letters are careful to emphasize anonymity for respondents. A personalized cover letter could negate the advantage of anonymity of a mail questionnaire. Andreasen did a study using a questionnaire sent out to lottery winners under the assumption that they would prefer anonymity because of the harassment from sales agents. He varied three levels of personalized cover letters with the questionnaire. His findings were inconclusive, though the most personalized, handwritten form of correspondence was somewhat less effective in generating response. He found it took a significant dose of personalization to secure a moderately significant

effect on response rate. Therefore, he concluded that the costs of personalization usually are not justified by their benefits and adds that in some studies, and for some respondents, the expenditures for personalization may have the opposite effect than the one desired.

Timing. Timing the questionnaire arrival could also have an effect on the response rate. The SREB (1978) reported that a questionnaire timed to reach students around the middle of November had the advantage of perhaps finding them at their parents' homes, which might correspond to the permanent address of the student on college records. "Some institutions have found the response rate increased when a mailing was timed for the Thanksgiving holiday" (p. 19).

Reminder postcards have frequently been employed to increase response rate. Nichols and Meyer (1966) performed a study with various time schedules for sending out the reminder postcards. These postcards included a "thank you" to those who had promptly returned the questionnaire and a request to those who had yet to return the questionnaire to do so. Nichols and Meyer found that a thank you and reminder postcard, sent three days after the questionnaire mailing was the most effective time for increased response. The best overall response came from using both the three day postcard reminder and a later (45 days) second mailing of the questionnaire.

Length of the questionnaire. The general opinion on the length of the questionnaire has been the shorter, the better (Erdos, 1974; Filion, 1975; Parten, 1950; Robin, 1965). This assumption was based on the theory that respondents would be more willing to fill out a

questionnaire that would take less of their time than a longer, more time consuming one. According to Erdos (1974) a questionnaire that became long, six pages or more, should be administered by a well trained interviewer who can maintain the respondent's interest (p. 2-92). He further stated that when the mail questionnaire becomes too long, the percentage of response falls off sharply.

Sletto's (1940) findings suggested the length of the questionnaire was not an important variable in questionnaire response rate. Clausen and Ford (1947) further challenged the widespread belief that a shorter questionnaire would elicit a higher response rate. They showed that a multi-subject questionnaire obtained a larger response in its initial mailing than a shorter, single subject questionnaire. They also reported that one or two pages of supplementary questions did not affect responses to a three to six page questionnaire.

Champion and Sear (1969) varied the length of a questionnaire in their follow-up study after they noted that other researchers reported that generally shorter questionnaires were returned more frequently. They performed a study utilizing questionnaires of three different lengths. Their results were that the longer questionnaires were returned most frequently, both in the initial and the second mailing. These results differed considerably from accepted beliefs about mail questionnaires. The SREB stated that there is a consensus among experts on surveying, that shorter questionnaires yield higher response rates than longer questionnaires (p. 12). The Champion and Sear (1969) results and the Clausen and Ford (1947) results indicated that the issue of questionnaire length was more complex than first realized and deserves further study.

Dillman (1972) took his questionnaire and had it and the cover letter photographically reduced and put in booklet form to make the questionnaire appear smaller. He performed two studies, one in 1970 and one in 1971, and obtained a response rate of 75% for each study (p. 255). The appearance and form of the questionnaire should also be considered for size and respondent's interpretation of the size, according to Dillman (1972). Erdos (1974) stated that the layout of a questionnaire should be designed to avoid a crowded appearance (p. 2-99).

Repeated mailing. The SREB (1978) reported that all institutions have found that repeated mailings of questionnaires did improve response rates:

> The added cost of extra mailing, however, must be weighed against the improvement in response rates. A minimum of two mailings is universally recommended by those with experience. Responses continue to rise after two mailings, but at diminishing rates. (SREB, 1978, pp. 19-20)

Some studies use a reminder postcard as the second mail out, but the SREB suggested that each mailing include a questionnaire. A suggested time limit for returning the questionnaire should also be included, with ten days to two weeks being suggested by the SREB. Selgas (1977) in his follow-up study, included two mailings of the questionnaire with a cover letter and a stamped addressed return envelope. He separated the mailings by one month and obtained a 70% response rate to deliverable questionnaires. Cox (1966) reported that previous recommendations were to schedule one month for a two wave mailing. But, if projected time was critical, then a two wave mailing could be conducted in a two week period without too much loss of response since a majority of the returns arrive soon after the mailing.

McKinney and Oglesby (1971) provided a list of recommendations for performing follow-up studies which stressed repeated mailings. Once the reason for the follow-up questionnaire was determined, the population to be studied should be chosen. The next most important part of any follow-up study was selecting the information gathering instrument. A useful procedure for developing a follow-up questionnaire can be found in McKinney and Oglesby's 1971 article, as well as in the Follow-up Surveys of College Graduates by the SREB (1978). McKinney and Oglesby list recommended steps for performing a follow-up study. They started with what they call an "alert card," which was an advance letter informing the student of the upcoming questionnaire and its importance. The student was urged to complete and return the questionnaire. Following is the order suggested by McKinney and Oglesby for performing a follow-up study using a mail questionnaire. They suggested the steps be performed at one week intervals:

First mailing	"Alert card."
Second mailing	Follow-up instrument, cover letter, and return evelope, stamped and addressed.
Third mailing	First thank you reminder card.
Fourth mailing	Second request follow-up instrument (second cover letter, and return envelope stamped and addressed).
Fifth mailing	Second thank you reminder card. (p. 16)

Interest. Warwick and Lininger (1975) reported from their own observations that the greater the intrinsic interest of the subject matter to the respondent's personal interest, the better the chances of a high response rate (p. 132). Berdie and Anderson (1974) reported that offering the respondent the results of the study can sometimes stimulate interest and response (pp. 58-59).

Baur (1947-48) reported that interest in the subject of the questionnaire can increase response bias. He found that when comparing early to late respondents, those interested in the subject returned their questionnaires early while those not as interested returned theirs late.

Monetary incentive, first class versus third class mailing, stamped versus business reply envelopes, advance letter, personal versus non-personal wording of the cover letter, timing of questionnaire and follow-up mailings, length of the questionnaire, repeated mailings, and intrinsic interest are all different tactics for increasing response rate. Berdie and Anderson suggested the use of varying tactics for different samples and studies to maximize response rates (1974, p. 53).

Cost Effectiveness

Rossmann and Astin (1974) performed a study where they compared the different tactics and techniques for increasing response rate to the costs of performing those techniques. In their study of cost effectiveness, they investigated the cost in comparison to the response rate of first class versus non-profit outgoing postage, business reply versus live stamp return, matched insertion in envelopes versus window envelopes, auto typed letters versus personalized letters, one mailing versus two mailings (with and without a reminder postcard), and types of non-profit permits.

The results of the Rossmann and Astin study (1974) generally held that the least expensive methods of performing a mail questionnaire follow-up were the most cost effective. In comparing first class postage to non-profit postage, the results showed that using first class

postage caused an increase in response rate that varied from 0.2% to 3%. The cost per response, however, favored non-profit postage with the savings varying from 8¢ to 18¢. In the comparison of business reply versus live stamp return, they found that live stamp increased response rate by no more than 2%, but costs were considerably more, varying from 14¢ to 23¢ higher per response.

Their matched insertion versus window envelopes comparison found the additional cost of matched insertion was approximately $15.00 per thousand questionnaires. The results favored the window envelope with response rate increasing slightly for window envelopes and cost per response between the two techniques being similar.

The use of auto typed letters, with a personally addressed questionnaire included in the second wave, resulted in the highest rate of return, but also had the highest cost. The 3% increased response rate hardly seemed to justify the increased cost of 59¢ per response, according to Rossmann and Astin (1974).

A postcard reminder, but no second mailing of the questionnaire decreased costs, but the response rate decreased 10% below the use of a second mailing of the questionnaire. The 10% difference in response rate was deemed, by Rossmann and Astin (1974), worth the extra cost for the second mailing of the questionnaire. No postcard reminder with no second mailing of the questionnaire had the lowest cost, but also the lowest response rate. It was observed that a postcard reminder between the first and second mailing made little difference in the results. Therefore, a second mailing of the questionnaire, without a postcard reminder, seemed to provide the maximum benefit to response rate without unnecessary additions to costs.

Rossmann and Astin (1974) also used three types of nonprofit permits: printed, precanceled stamps, and meter. The data showed the difference among the three methods was small, with a slightly higher response rate produced with precanceled stamps.

The overall results of the Rossmann and Astin (1974) study were that the use of nonprofit outgoing postage, window envelopes, and business reply return postage resulted in considerably lower costs per contact and per respondent, and did not lead to significant lower response rates. The use of a second mailing of the questionnaire proved to be an effective technique for increasing the response rate while the use of reminder postcards and various types of nonprofit postage had little impact.

Length of Time

Dillman (1978) reported that mail questionnaires are usually locked into a definite time schedule of printing, folding, stuffing, and mailing dates; and the different methods for increasing response rate can affect the length of time involved in a study (p. 67). Exact time limits are not available. Parten (1950) reported that mailing costs are low compared with the transportation, as well as time costs, associated with studies which require a field staff. The expensive and time consuming task of training a staff of investigators is absent with the mail questionnaire (p. 94). Time involved in performing a follow-up study is associated with costs since the longer a staff member is on the payroll, the higher the costs. The lower costs of mail questionnaires could be associated with less time involved needed to perform a follow-up study.

Jackson and Rothney (1961) stated the economic advantage of the mail questionnaire was in saving cost and time (p. 571). Kephart and Bressler (1958) stated the reason the mail questionnaire has come to be favored by social scientists is for the expediency of the study (p. 123). According to Kephart and Bressler, information can be produced more quickly by the mail questionnaire than by interview methods (p. 123).

Berdie and Anderson (1974) stated the use of mail questionnaires could facilitate collecting data from an extemely large sample in a short period of time (pp. 17-18). However, they continued, "with small sample sizes, questionnaire administration may be more time consuming than interviewing each subject" (p. 18).

The length of time for the development of a mail questionnaire does vary. The development of an instrument and planning the follow-up study depends on the situation and people involved, and will not be dealt with here. The time involved with the actual performance of the study will be considered the length of time of the follow-up study.

The start of a mail questionnaire follow-up study shall be when the first mail out of the questionnaire takes place. According to the National Opinion Research Center, six weeks to three months are required from the start of a follow-up study until the data are ready for final form. Two to three weeks are required before the last completed questionnaire is received, and from one week to a month is needed to tabulate figures and compute percentages (Parten, 1950, p. 61).

Nichols and Meyer (1966) studied the effect of a third day postcard reminder and a 16th day postcard reminder on response rate.

By the 16th day, 58% of the group receiving the third day postcard reminder had returned their questionnaire, but only 37% of the group not receiving the third day postcard had returned their questionnaire. After 45 days, there was no difference between the two groups. The results suggested that a third day postcard elicited the highest rate of return in the shortest period of time.

Dillman (1972) included a one week postcard, a three week letter, and a seven week mailing of a second questionnaire in his follow-up study. The response time after this final mailing would extend the length of this study to approximately ten weeks, after which would come the evaluation. Dillman (1978) listed eight weeks as the time needed to conduct the implementation of his total design method of conducting mail questionnaires (p. 67).

According to some authors, the time involved with the actual questionnaire distribution and collection can be shortened. Stanton (1939) noted that 90% of the total possible returns to a mail questionnaire would be returned within three weeks following the first mailing of the questionnaire. Francel (1966) reported that it is well known that in mail questionnaires, the majority of replies tend to come in during the first week after mailing. The remaining come in at a rapidly diminishing rate over the succeeding three or four weeks (p. 89).

Boyd and Westfall (1964) reported that a minimum of two weeks was usually necessary before the bulk of the returns from one mailing were in. Scott (1961) reported that most researchers seem to assume that the best policy was to wait until returns have almost stopped before sending the second follow-up (p. 166).

Cox (1966) performed a follow-up study to investigate response patterns with mail questionnaires. He reported that the approach of waiting for the returns to slack off could cause unnecessary rejection of mail surveys as a research method when time was very short (p. 392). He reported that previous studies of response patterns to mail questionnaires have resulted in recommendations that one month be used for a two wave questionnaire (p. 396).

Clausen and Ford (1940) reported that mailing intervals may be cut down by perhaps one half. A second mailing can be made before the first returns have finished coming in. The drawback is that some questionnaires will go needlessly to those who are in the process of responding.

The data from Robinson and Agisim's study (1951) showed that response is low during the first six days, but there is an increase in cumulative returns on the seventh day. This seems to be a standard response pattern. According to Cox (1966), these data suggest that it would be unwise to employ a mailing interval of less than seven days. Cumulative returns in the Robinson and Agisim study exceeded 90% on the 14th day. Cox (1966) concluded that the optimum mailing interval therefore should be between the 7th and 14th day after the previous mailing.

Gray (1957) found that response patterns for the second mailing of a questionnaire are almost identical to the pattern of the first mailing. Therefore, according to Cox (1966), the same mailing interval can be used for all mailings. Cox went further to point out that

if there were no significant differences between the replies to the first and second mailings, there would be no need to mail out the questionnaire a third time (p. 395). He stated that the total time required to conduct a two wave questionnaire in the event of a short time frame, would be approximately two weeks.

Erdos (1974) supported the two weeks time period. He stated "by sending out a single mailing by air, a nationwide survey of a large sample distribution all over the United States can be completed in two weeks" (p. 2-91).

Mooren and Rothney (1956) performed an experiment to observe if personalized forms of mail questionnaires would produce faster responses than general nonpersonal forms. They found no significant difference among the personal and general groups of their experiment in terms of speed of response (p. 412).

In spite of researchers' attempts to decrease the length of time required to perform a mail survey, the time still depends on various factors, such as size of the study, the response rate desired, and the pattern of response. Researchers have condensed the time to a minimum of two weeks for a two wave questionnaire (Cox, 1966).

Personnel Required

The personnel involved with a follow-up study depends on the size of the study and the resources available. Many educational institutions use their everyday staff to perform a follow-up study. Basically, a mail questionnaire requires clerical help in the areas of typing, printing, and putting the follow-up instrument in the mail envelope. When the questionnaires are mailed back, they must be organized and

tabulated, using clerical help or keypunchers. A programmer may be needed to program the statistical analysis before the results are ready to be evaluated and reported.

Parten (1950) reported that mail questionnaire studies are less expensive than other methods of follow-up because there is no large staff to train. More staff may be needed if there are plans to collect data from the people who do not answer the questionnaire.

Dillman's (1972) follow-up studies consisted of mailing out 4,500 questionnaires each. He used 1,215 labor hours for each study to perform the data collection process. In this instance, Dillman used a substantial amount of labor but was performing a follow-up study on a relatively large sample.

Franzen and Lazarsfeld (1945) reported one of the advantages of the mail questionnaire was that it required few personnel. They stated "the mail can carry a questionnaire into any territory and at the same time can make the collecting of information a one-man job" (p. 293). Benson (1946) also reported that widely scattered geographic coverage can be obtained more easily and less expensively through mail questionnaires than through personal interviews. Erdos (1974) stated that mail questionnaires can be conducted from one office with built in checks and controls for every phase of the operation (p. 2-91). Dillman (1978) reported that the personnel requirements for the mail questionnaire were far less than those required for either personal interviews or telephone surveys with equal sample size, and the skills required were mostly clerical (p. 67).

As Franzen and Lazarsfeld stated, a mail questionnaire can be performed by one person, even though most studies do employ some clerical

help. The mail questionnaire can get by on a small staff or a large staff, depending on the size of the sample, the budget, and the labor resources available.

Krueck (1975) disagreed with the prevalent opinion that questionnaires required fewer human resources and manhours than personal contact methods. He found in his follow-up methods comparison study, that 12.5 clerical manhours were required for labeling and stuffing envelopes, checking returned questionnaires, and assimilating information obtained through the use of telephone reminder calls (p. 22). He stated that his finding "should dispel any belief that fewer human resources are required in a mailed questionnaire unless one considers repeated mailings" (p. 22).

Quality of Data

The quality of the data had two main aspects in this study. First to be considered were the results of the study. Were the results based on true and accurate data? Second to be considered were the data. Were the data from which the results are taken complete? For the results of any follow-up study to be useful, they must be accurate, and the data must be complete. Otherwise, any conclusions drawn from the results will not be dependable.

Accuracy of information which is returned on a questionnaire can be difficult to verify. Parten (1950) supported questionnaire information because she believed the respondent may answer questions more frankly by mail since anonymity is frequently used. She also stated that since the questionnaires were standardized, that eliminated possible personal interviewer suggestiveness or bias (p. 94). On the negative side, Parten

(1950) suggested that since the respondent completes the questionnaire without the aid of a personal interviewer, misinterpretation of questions is possible (p. 95).

Franzen and Lazarsfeld (1945) reported an item in favor of mail questionnaires in the area of accuracy. They compared the mail questionnaire to the personal interview on the basis of respondents educational level. They found that apparently, when not faced by an interviewer, incomplete college and high school records were more willingly divulged (p. 311). From this finding, Franzen and Lazarsfeld concluded the mail questionnaire elicited more accurate responses in the area of reporting educational level. Benson (1946) agreed that mail questionnaires elicited more accurate data. He stated that it is conceivable that on certain subjects answers might be more reliable than those that could be obtained by an interview. Hochstim (1967) also concluded that respondents were more honest in mail questionnaires than the other methods of gathering data. Knudson, Pope, and Irish (1967) stated that research comparing questionnaires to interviews were rare, though a few studies have indicated that the questionnaire may be the more successful in gaining valid information.

Although the above researchers have contended that the questionnaire elicits accurate data, other researchers emphasized that it is difficult to check the accuracy of the responses on a mail questionnaire. Parten (1950) stated, "checks on the honesty and reliability of returns are difficult to devise when the personal interviewer does not see and size up the informant" (p. 96).

Obtaining completed questionnaires has been another problem with mail questionnaires. Hackler and Bourgette (1973) reported that mail questionnaires are usually more appropriate for collecting sensitive information (p. 276). But many researchers also felt that personal interviews, rather than mail questionnaires, elicited more complete answers. Jackson and Rothney (1961) performed a study utilizing both mail questionnaires and interviews. They concluded "the interviews elicited significantly more complete answers than the mail questionnaires" (p. 571). They also concluded the interview method drew forth more extensive responses to questions than the mail questionnaire.

Krueck (1975) explored the differences in the nature of responses elicited by each method of conducting a follow-up study. He found questions concerning satisfaction with instruction, counseling, and open-ended questions had a much higher frequency of nonresponse on a mail questionnaire. He also reported that the mail questionnaire elicited a greater number of negative responses when compared to the personal forms of data collection (p. 19).

Wotruba (1966) found that sending a monetary inducement with the questionnaire produced not only a better return, but also produced more completed questions. He concluded that when completeness of the questionnaire information was vital, immediate monetary inducement was beneficial.

Mooren and Rothney (1956) performed a study to discover whether personalization would produce more complete responses. They found no significant difference between personalized and general forms of questionnaires in terms of quantity of response (p. 412). Parten (1950)

summed up the advantages of the mail questionnaire as follows:

1. If mailed questionnaires are used, it is possible to cover a wider geographical area and to reach a much larger population with given funds than could be accomplished by personal interviews with each informant. This lower cost applies primarily if personal follow-ups are not made.

2. Mailing costs are relatively low compared with the transportation and costs for a field staff.

3. The expensive and time-consuming task of training a staff of investigators is eliminated. This assumes, of course, that a large staff will not be needed to collect the schedule data from the people who do not answer the questionnaire.

4. The informant may answer questions more frankly by mail since anonymity is assured. On the other hand, some respondents may hesitate to put their ideas in writing for fear that their schedules may be identified even though unsigned. Actually, it is questionable whether anonymity is either an advantage or a disadvantage.

5. The questionnaire may reach groups who are more or less protected from solicitors and investigators. In high-rent apartment houses or private homes where servants protect the occupants from solicitors and other doorbell ringers, for example, it is often difficult for investigators to gain admittance. Of course, the mere fact that the mail is received does not guarantee that it will not be filed in the wastebasket by a secretary or even by the addressee as soon as he glances at the heading.

6. Personal antagonism to investigators which may lead to a refusal to give the desired information is avoided.

7. If time is not an important consideration and if the sample extends over a wide area, the cost of securing practically complete returns is probably lower than in the personal interview method.

8. The questions are standardized, whereas in the personal interview the investigator may alter them or suggest answers.

9. The questionnaire can be answered at the convenience of the respondent. This gives him time to deliberate on each point, and if necessary, to look up information needed to fill in the items. However, he may consult other members of his household, so his reply may be more representative of the family's point of view than of his own.

10. It is claimed that the mail questionnaire brings many

more returns from the man of the house than does the telephone or personal interview method.

11. Where the persons to be reached are located in widely scattered areas of cities and are a mobil element of the population, it may be easier to locate them by mail (registered or special delivery) than by other methods. (pp. 94-95)

Parten (1950) also listed the disadvantages of the mail out questionnaire:

1. The people who return questionnaires are not representative of the groups to whom the schedules are sent. This limitation is sufficiently great to outweigh almost all the advantages listed above.

2. The returns from mailed questionnaires sent to the general public are usually very low, often ranging from about 10 to 20 percent. The percentage of returns varies greatly, however, with different schedules and informants. One survey of M.D.'s in New York State received about 50 percent returns without follow-ups. By continued effort the returns may be increased considerably over the first responses. The techniques for increasing mail returns are dealt with in Chapter XI (in the Parten Book).

3. Since the informant fills in the data on the questionnaire without the assistance of an investigator, he may misinterpret questions, omit essential items, or send in material which cannot be put in form for tabulation, thus making it necessary to discard many of the questionnaires.

4. The questions used must be simple and practically self-explanatory, since no training can be given the informant on their meaning and on how to fill out the schedule.

5. In most studies, the questionnaire must be relatively brief if high returns are to be obtained.

6. If the sample is to be unbiased, it is necessary to supplement the mailed returns with information obtained by personal interviews with the nonrespondents.

7. Checks on the honesty and reliability of returns are difficult to devise when the personal interviewer does not see and size up the informant.

8. It is practically impossible to return unsatisfactory or incomplete schedules to the informant for correction.

9. Because most people would rather talk than write, questionnaires must be made very interesting to induce responses.

10. An up-to-date address list of potential survey informants is difficult to find.

11. Mail returns from the last third of the respondents come in slowly; hence the mail survey must be spread over a relatively long period, if a high percentage of returns is to be secured.

12. Many questions which might antagonize the respondent cannot be included on the mail questionnaires but can be asked in personal interviews when the informant gradually can be led around to the subject. (pp. 95-96)

Telephone Survey

Telephone surveys consist of interviews taking place over the telephone rather than in person. Dillman (1978) reported that research literature on telephone surveys was as thin as that for the mail questionnaire was thick (p. 9). The telephone survey was used in the Literary Digest debacle of 1936. The Digest pollsters predicted a landslide victory for Landon over Roosevelt in the presidential race. Using the telephone caused a clear social class bias since only 35% of households in the United States had telephones (p. 9). Therefore, the poll predicted incorrectly and the use of the telephone as a survey method was generally used only as a complement to other survey methods (p. 9).

As the percentage of households having telephones increased, so did the feasibility of the telephone survey. Dillman (1978) reported that the use of the telephone survey had mushroomed in the 1970's (p. 10). Payne (1974) reported that interviews by telephone were satisfactory, efficient, and economical for a wide range of survey purposes (p. 2-105). Warwick and Lininger (1975) agreed. They stated that

researchers conducting follow-up studies have turned increasingly to the telephone survey (p. 130). They reported the telephone survey had many of the advantages of the personal interview, yet it was considerably less expensive. It overcame the problem of mounting refusal rates in some areas where strangers coming into the home were unacceptable. Some respondents who would not allow an interviewer in their home were perfectly willing to talk with the same individual on the telephone (p. 130).

Warwick and Lininger (1975) also reported the limitations they associated with the telephone survey. In their opinion, the greatest drawback was the difficulty of establishing the same rapport that was possible in a personal interview situation. With the telephone survey, there was a lack of communication through facial expression, appearance and sheer physical presence. Other limitations reported by Warwick and Lininger included the respondent's ability to hang up. As a result, telephone surveys were usually shorter and less demanding than personal interviews. The asking of sensitive questions was also limited because it increased the risk that the respondent would hang up.

In Payne's (1974) opinion, the main drawback of the telephone survey, at least historically, was the fact that not everyone had a telephone (p. 2-105). With well over 95% of all households obtaining telephones, the chance of response bias due to lower income groups not possessing a telephone was reduced (Dillman, 1978, p. 9). But those in higher income groups who decided to have unlisted telephone numbers could again induce response bias if the telephone directory

was the information pool from which the sample was drawn (Payne, 1974, p. 2-107). Also the problem existed where higher income homes had more telephones, and possibly a better than average chance of being included in the survey. An indirect sampling technique which employed the local telephone exchange and random numbers for the last four digits could be utilized (Payne, 1974, p. 2-119). For further suggestions on sampling techniques to be used in telephone surveys, see Payne, "Data Collection Techniques: Telephone Surveys," in the Handbook of Marketing Research (Payne, 1974). For the purpose of this paper, it will be assumed that sampling is not a problem, that the researcher has access to the telephone numbers needed to perform a study.

McKinney and Oglesby (1971) also reported on the effectiveness of sampling when used for a telephone survey. They stated that while the telephone interview is limited to the amount of information which can be obtained, it may be the only workable procedure for some segments of the population (p. 9).

The telephone survey technique will be reviewed using the five variables previously chosen to compare and evaluate the various follow-up methods. The five variables are: costs, response rate, length of time, personnel required, and quality of data.

Costs

Denton et al., (1977) reported that a telephone survey required a large monetary investment to locate and actually contact potential respondents by phone. Comparing the telephone survey to the personal interview, Parten (1950) reported that the telephone survey could provide a tremendous savings in transportation costs (p. 86). Weiss and

Hatry (1971) agreed that by utilizing the telephone survey, travel was eliminated and costs reduced (p. 23). They estimated that for 500 telephone interviews, the average cost per interview would be $17.00 (see Table 5). They included detailed costs for preparation. Considering only actual interviewing costs, the costs for the study were $9.33 per response.

Thomas Krueck (1975) performed a comparison of three methods of conducting a follow-up study. He reported that as conducted in his study, the telephone survey required no immediate out-of-pocket outlay of funds (p. 22). The costs were involved with the manpower needed to make the telephone calls. He employed research assistants and paid them $5.00 an hour. He calculated that 55 hours and 12 minutes were devoted to telephone calling, producing a total cost of $276.00. The response to the telephone survey was 108 out of 164 possible responses, or a 66% response rate. Therefore, the cost per response was approximately $2.55.

Payne (1974) agreed that an advantage of the telephone survey over the personal interview was in the area of cost savings. He stated:

> Generally, the shorter the actual interview time relative to other time factors, the greater the economy of the telephone method . . . seldom . . . do the data collection costs of the telephone survey exceed two-thirds of the comparable costs of the personal survey. (p. 2-110)

Payne continued on to state that differences in costs between telephone and mail surveys depend on the response rates.

> Depending primarily on mail response rates, one or the other may prove more economical, since the mailing cost per return for a 10 percent mail response is essentially five times that for a 50 percent mail response. (p. 2-110)

Table 5

Cost Estimates For Telephone Interviews

		For 500 telephone interviews
1.	Overall planning and direction	-
2.	Preparing listing	$ 500
3.	Selecting sample	300
4.	Developing interview questionnaire (including conferences, 20 pretest personal interviews, 10 pretest telephone interviews)	600
5.	Reproducing interview questionnaires, training materials, manuals, supplies	650
6.	Interviewing costs	
	a. Recruitment	200
	b. Training (20 interviewers for 15 hours, plus salary of trainer)	1,000
	c. Interviewing time	1,900
	d. Supervision	800
	e. Supplementary in-person interviews for 50 persons without telephones or not answering	1,000
7.	Editing, coding, punching, tabulating	800
8.	Telephoning	500
9.	Mailing	10
10.	Analyzing data and report writing	150
11.	Reproducing report	100
	Total	$8,510
	Average cost per interview	$17.00

Note. From An Introduction to Sample Surveys for Government Managers, by C. H. Weiss & H. P. Hatry. Washington, D. C.: Urban Institute, 1977, p. 47.

Response Rate

According to Parten (1950) the response rate on the telephone survey depended on whether or not recalls were made on "no answers" and "busy signals" (p. 89). She reported that only about 1 1/2% refused the calls, and about 1/3 were incomplete due to no answers or busy signals. Therefore, approximately 2/3 of the calls made resulted in completed interviews on the first call.

The response rate to a telephone survey was believed to depend on the length of the survey, but studies listed by Dillman (1978, p. 55) found only 2% to 4% of the respondents refused to complete a telephone survey lasting from 20 to 30 minutes. Dillman (1978) reported that it was not known how long interviews could be before cut offs become a major problem, but the evidence clearly suggested that once people were on the telephone, the length of the interview did not appear to affect the response rate (p. 55).

Michael Quantz (1977) performed a telephone survey of community college career students who graduated between 1973 and 1976. Telephone interviewers, people actually in the program the respondents had graduated from, attempted 228 contacts. If the graduate was not available, the desired information was obtained from a relative or co-worker. The interviewers completed 191 of 228 possible contacts. The response rate for this study was 84%.

Krueck's 1975 study performed a comparison of the three methods of conducting a follow-up study. He reported that the telephone survey methods had a higher response rate than the personal interview or the mail questionnaire. The response rate in his study was approximately

66%. Following were the reasons listed by Krueck for any lack of response to the telephone survey: 11 were either a wrong number or a disconnected telephone, 19 had moved out of the local telephone district, 14 could not be followed-up, and 1 refused to respond (p. 17).

Warwick and Lininger (1975) reported that perhaps the greatest success with the telephone survey was seen when it was used as a follow-up to a personal interview. A study using a personal interview with multiple follow-up using a telephone call obtained a response rate of 97.6% (p. 131).

Length of Time

Parten (1950) stated that the telephone survey brought about a savings in time as well as in costs, and it could be used when a study needed to be conducted quickly and inexpensively. Parten also noted a large portion of a population of a community could be covered in a short time due to the fact a few telephone callers could make several hundred calls per day (p. 86).

In Krueck's (1975) study a total of 303 phone calls were made to obtain the response of 108 former students. The actual interviews taken over the telephone required approximately 15 minutes each for a total of 27 hours. The preliminary calls averaged 4 minutes each for a total of 13 hours. Therefore, the actual number of minutes required to obtain each response was 22 minutes (p. 23).

Payne (1974) stressed the need for interesting questions on interesting subjects in telephone surveys (p. 2-108). It was much easier to hang up when bored, than to ask an interviewer to leave. Although it was once thought that telephone interviews must be brief, telephone

interviews have gone on for as long as 25 to 30 minutes (Payne, 1975, p. 2-108). Payne gave the warning that, "a careful look might better be taken at the questionnaire to judge whether its inordinate length is justified" (p. 2-108).

The time involved to perform a follow-up telephone survey varied not only according to the length of the interview, but with the number of people placing the calls, and the number of recalls made. Parten (1950) reported that the telephone survey was still the quickest of the three main follow-up research techniques (p. 91). Parten also reported that if the interview itself was brief, then an interviewer could complete about 30 calls per hour (p. 91).

Payne (1974) reported that more interviews could be done by telephone than in person within a limited time period, and more hours of the day could be productive (p. 2-110). Dillman (1978) stated that as a general rule, "telephone surveys are the fastest to complete" (p. 67).

Denton et al., (1977) alternately suggested that the telephone survey could involve a great deal of time if it was necessary to locate the potential respondents' phone numbers. In a situation which would require substantial amounts of time to locate respondents and gather telephone numbers, then the telephone survey would not necessarily be the quickest method of a follow-up study.

Personnel Required

The central people involved in a telephone survey are the people who make the telephone calls. Almost all the other factors, such as cost, time involved, and even response rate, depended on the people making the telephone calls. According to Parten (1950, p. 90), if good

interviewers were employed, the number of refusals would be low. She also reported that it was easy to train and supervise interviewers since they could work all in one room directly beside the supervisor (p. 91).

In Quantz's (1977) study, the telephone interviewers were faculty members from the different program areas. They contacted the student who had graduated from their particular program. No special training was required.

Dillman (1978) reported that personnel requirements for telephone surveys were less than for personal interviews, but more than for mail questionnaires (p. 66). Close supervision meant the skills and training needed could be developed as on the job training. In college and university settings, students with flexible schedules and training in research methodology could be used.

The size of the sample or population determines the number of telephone interviewers required. Other people involved with the follow-up study, such as statistical and keypunch operators, varied according to the size of the sample, not the method of follow-up employed. With the telephone survey, one or two telephone interviewers could investigate a large portion of the population in a short time because several hundred calls could be completed per day (Parten, 1950, p. 86).

Dillman (1978) reported that with a telephone survey:

> Relatively few interviewers can conduct a large number of interviews in a short period of time, in sharp contrast to the rate of two or three a day often expected for face to face interviews. (p. 66)

Quality of Data

To discover the quality of data, two considerations must be taken into account; the accuracy and truth of the data, and the completeness of the data.

Already mentioned was the belief that a telephone survey must be short, nondemanding and void of sensitive questions to get respondents to respond with accurate data (Warwick and Lininger, 1975). This limited the type of data that could be collected and therefore could reduce the ability of the researchers to accurately ascertain information on certain subjects.

Payne (1974) disagreed. He reported that respondents may reply with greater candor to personal questions asked on the telephone than to the same questions asked in person (pp. 2-122).

A major problem connected with the telephone survey for collecting accurate and true data was improper sampling. Weiss and Hatry (1971) reported that since not everyone had a telephone, there was sampling bias with studies utilizing telephones. Lower income people have fewer telephones and some people have unlisted telephone numbers. According to Weiss and Hatry (1971), a recent investigation showed that people with unlisted telephone numbers were primarily middle income and disproportionately black (pp. 23-24). Therefore, researchers employing the telephone survey should consider the intended respondents, to ascertain whether or not a telephone survey will produce sampling bias.

Another problem with telephone surveys, according to Warwick and Lininger (1975), was that telephone surveys were sometimes used for magazines and other lead-in sales presentations as well as other types of phone solicitation (p. 131). Parten (1950) stated that if the respondent was annoyed by the phone call, he or she may deliberately give misinformation (p. 87). Without the interviewer actually facing the respondent

to observe his or her reactions, the interviewer must accept the answers without question (Parten, 1950, p. 87).

According to Parten (1950), other limitations that existed when gathering data using a telephone survey was the lack of privacy on party lines, housewives answered the phone more often than other members of the family, and misinformation was hard to check in short telephone calls (pp. 89-92).

One problem Payne (1974) reported was that open-ended questions might not be answered in as great detail over the telephone as in person (p. 2-108). Although the answers could be shorter, much of the extra verbiage was repetition or elaboration. Therefore, telephone surveys usually provided complete answers even if less words were used.

When considering completeness of data, Parten (1950) reported that the telephone interview must be short, so only a few brief items could be investigated (p. 87). Therefore, certain topics which would require extensive information would not be able to gain complete data from a telephone interview.

Krueck (1975) found that negative comments were inhibited in the two forms of personal contact, the telephone survey and the personal interview. He also found a lack of consistency in negative answers when comparing mail questionnaires to the telephone survey. He suggested further research was needed with regard to the effect on personal involvement in willingness to report in a negative manner (p. 19).

Hochstim (1967) reported that the personal interview elicited the highest number of socially desirable answers, the mail questionnaire elicited the least number of socially desirable answers, the telephone

survey fell between the two. Dillman (1978) stated that it seemed that the transfer of the interviewer from the scene to the telephone decreased the probability of socially desirable responses (p. 62).

Payne (1974) reported that the telephone interview was midway between the zero interviewer effect of the mail questionnaire, and the pronounced interviewer effect in the personal interview. According to Payne (1974), as little as possible of interviewer bias should go into the recorded responses. To accomplish this, questions should be asked in a standardized manner (p. 2-111). Dillman (1978) reported that the distortion from interviewer bias would be easier to control in a telephone interview than a personal interview with the opportunity for closer supervision (p. 69). He also concluded that the telephone interview was the best method in terms of the ability to control contamination from other people (p. 65).

In a telephone interview, completeness of data depended on a completed phone interview. To accomplish this, researchers have suggested short interviews, avoiding sensitive questions, and employing well-trained and competent interviewers to "sell" the respondent on the importance of the interview (Parten, 1950, pp. 86-93; Warwick & Lininger, 1975, pp. 130-131).

Parten listed the following advantages of the telephone survey as a summary of the follow-up technique:

> 1. The telephone interview is the quickest of the survey techniques. Interviewers can complete about thirty calls per hour if the calls are brief. It is especially adapted to surveys of radio programs where a great many interviews must be made during a given program.
>
> 2. The refusal rate is usually low among people who are reached by phone.

3. The coincidental method can be used thus eliminating the memory factor.

4. It is easy to train and supervise interviewers since they can work in one room directly beside the supervisor.

5. The approach and questions are easy to standardize from one interviewer to another.

6. The cost per completed interview is low for the sample covered.

7. The geographic distribution of the sample can be easily controlled. An address listing of numbers is usually available and can be used for drawing the sample.

8. For studies of middle- and high-income groups, the telephone interview may be satisfactory because most of them have phones.

9. Interviews may be scattered over a wide area within a city without adding to the cost.

10. As compared with a mail questionnaire, the telephone survey is preferable because it usually costs less per return. Returns are higher on first solicitation, and they can be more effectively controlled from the point of neighborhood distribution. (pp. 91-92)

Parten listed the following disadvantages of the telephone survey:

1. As a sample of the general population, telephone subscribers are not representative. So unless the telephone interview is supplemented by a method that covers nonsubscribers, it should not be used. Less hang half of all homes in towns over 2500 had telephones.

2. Detailed data cannot be gathered by this method because the informants soon become annoyed or impatient. If the schedule is too lengthy, the informant may either hand up or give unreliable answers.

3. When observation of the situation is an important element, the telephone interview is not useful. If the interviewer is supposed to evaluate the answers as to trustworthiness, he has very little to go on in a short telephone conversation.

4. Information about the respondent must be limited to one or two facts. Such items as age, nationality, income, etc., are difficult to secure by telephone.

5. Attitude scales must be used with caution. Also, opinions are less likely to be given freely since the informant cannot be certain of the credentials of the person calling.

6. Since rural telephone ownership was low, the telephone interview is not useful in such areas. Also, because rural rates are higher than urban, the cost of telephone inquiries is greater than in cities.

7. The brevity of the introduction and questions does not give the informant much time to orient himself to the subject matter of the survey. Reactions requiring careful thought such as criticisms of various products, suggestions as to new uses of products, appeals, etc. -- should not be obtained by this technique.

8. The telephone situation neither encourages the respondent to amplify his replies nor gives the interviewer much time to jot down the comments. A face-to-face interview is more conducive to a considered response.

9. The task of checking on no-answers, wrong numbers, busy signals, etc., is time-consuming but must be done if the sample is to be representative of telephone subscribers.

10. It is difficult to secure privacy on party lines.

11. The time may come when the telephone technique will be used by so many groups that informants will develop an antagonism to all telephone inquiries.

12. The surveyor must be careful not to antagonize informants by phoning too early or too late in the day. One well-known survey agency makes it a policy never to call before 8:30 A.M. or after 10:30 P.M.

13. Misinformation is hard to detect and check in short inquiries. (pp. 92-93)

In his 1975 study, Krueck stated the results of his study supported the idea that more attention should be paid to telephone interviewing. It had produced a higher response rate than the mail questionnaire or the personal interview with only slightly higher costs than the mail questionnaire and much lower costs than the personal interview.

Personal Interview

According to Warwick and Lininger (1975), a personal interview is a form of verbal interaction designed to obtain information satisfying the objectives of a particular study. "The interviewing process is decidedly interactive, involving communication between the interviewer and respondent" (Warwick & Lininger, 1975, p. 182). The standardized interview, which was designed to collect precisely the same categories of information from a number of respondents so that the answer of all respondents could be classified and compared, is the type of interview which will be referred to in this paper as a "personal interview" (Gordon, 1975, p. 60). Three purposes for the personal interview were suggested by Froelich and Darley (1952). These were supplementing information, verifying information, and observation of characteristics or mannerisms.

Mayer (1974) reported that personal interviews were certainly the most common way of gathering data in marketing research. He described the personal interview as the most flexible method of data collection. According to Mayer:

> The interviewer's physical presence enables the researcher to use various forms of interaction between the interviewer and the respondent. The most common interaction is that the interviewer asks questions of the respondent, following a structured format or questionnaire, and records the respondent's answers on the questionnaire. (p. 2-82)

Warwick and Lininger (1975) reported "the success of the personal interview depends on the quantity and quality of the information exchanged between the interviewer and the respondent" (p. 182). They stated four interacting parties or conditions affect the flow of information; the interviewer, the respondent, the topic, and the immediate interviewing situation. The interviewer, facing the respondent, must

communicate the question, motivate the respondent to cooperate, probe for additional information, and record the information gathered from the respondent. The respondent must provide answers which are complete and truthful. The topic should stimulate the interest of the respondent without arousing anxiety, hostility, or fear. The interviewing situation must consider such conditions as the time and place of the conversation, the presence of any "third parties," and the similarities between the interviewer and the respondent (p. 183).

Mayer (1974) reported that the personal interview assumes the least about the respondent (p. 2-85). The human interaction element brought variability to the personal interview follow-up method. The personal interview will be reviewed using the five variables previously chosen to compare and evaluate the various follow-up methods. These five variables are: costs, response rate, length of time, personnel required, and quality of data.

Costs

It was generally agreed that conducting personal interviews was an expensive method of gathering follow-up information. Since an interviewer must be physically present, personal interviews were more expensive than other methods of follow-up (Mayer, 1974, p. 2-85). Sudman (1967) reported that from 30% to 40% of the interviewer's time was spent interviewing. Mayer (1974) reported:

> The interviewer spends time in learning the specific requirements of the survey, traveling to the designated areas, locating the required households, identifying the desired respondent, asking questions, recording the answers, and submitting the completed work. Many of the attempts to contact potential respondents may be unsuccessful. (p. 2-86)

Travel costs, including transportation expenses, interviewer time, and

the training of interviewers increased the cost of personal interviews.

Jackson and Rothney (1961) reported that for every dollar spent for their mailed questionnaire study, approximately 60 dollars were spent on the personal interview study. In this instance, the interview method cost 60 times as much as the mail questionnaire method.

Krueck (1975) analyzed the costs in a comparison study of the three methods of conducting follow-up methods. The personal interview method included the travel which was converted to a dollar figure at a rate of 10¢ per mile. Krueck's study was fortunate in that 60% of the interviews were conducted at the study sight, requiring no travel for the interviewer, and thereby saving expenses. For the off location interviews requiring travel, the average distance traveled one way was seven miles. Thus a minimum of 284 miles were logged in conducting interviews for a cost of $30.20. Clerical help and other manpower costs brought the total cost of the personal interview study to $426.50. When the response rate was considered, the cost per response was $5.86. Krueck concluded that the personal interview follow-up method was the least cost effective method when compared to the telephone survey and the mailed questionnaire.

Weiss and Hatry (1971) reported that in the early 1970's, professional interviewers were earning from $2.00 to $3.00 an hour. Interviewers usually received pay not only for interviewing time, but for time spent in training, reading instruction, traveling, locating and contacting respondents, and preparing the data after the interview (p. 20). Further costs associated with the personal interview method, according to Weiss and Hatry (1971), were the time and money spent for recruiting and selecting the interviewers, and for trainers and supervisors. Weiss and

Hatry listed the following factors as having an effect on interviewing costs:

> --Productivity (number of interviews completed per hour), depending on the interviewers' ability, experience and motivation.
>
> --Time spent for call-backs to respondents who were not at home on the first call. Procedures should limit the number of attempts to reach any one respondent (three is a common limit).
>
> --Neighborhood being surveyed. In some areas, costs go up because residents refuse to open their doors to strangers, pairs of interviewers are needed for security reasons, housing or population listings are inadequate, and so forth.
>
> --Travel time and costs between interviews, and from interview locations to the survey office.
>
> --Financial payment to respondents. Most experienced survey researchers frown on paying respondents for participating, except as a last resort, but some advocate it. (pp. 20-21)

Weiss and Hatry (1971) emphasized that costs with the personal interview method relate directly to the sample size and the number and complexity of questions. Answers that allow easy coding take little time, whereas long narrative and open ended questions required the development of careful classifications and cross checking of different coders' decisions on classifications (p. 21).

Table 6 displays the costs estimated by Weiss and Hatry for conducting 500 interviews. The table shows that costs could range from a low of $11.87 per interview to a high of $39.80 per interview. Considering only interviewing costs, the cost per interview was $14.60. For 400 interviews their cost estimates were a low of $12.71 per interview to a high of $44.13 per interview. For 1000 interviews, cost estimates ranged from a low of $10.90 per interview to a high of $33.00 per interview.

Table 6

Cost Estimates For Five Hundred Interviews

		Low	Moderate	High (but not highest)
1.	Overall planning and direction	-	-	-
2.	Preparing listing	$ 250	$1,000	$2,500
3.	Selecting sample, preparing maps, assigning households to interviewers	100	400	1,000
4.	Developing interview questionnaire (including conferences and 20 pre-test interviews)	200	600	1,000
5.	Printing interview questionnaires, training materials, manuals, supplies	250	650	1,100
6.	Interviewing costs			
	(a) Recruitment	-	200	500
	(b) Training (20 interviewers for 20 hours, plus trainer's salary)	1,150	1,500	2,000
	(c) Interviewing time (including travel, call-backs, recopying)	2,500	4,300	7,000
	(d) Field supervision	750	1,100	1,900
	(e) Travel expenses	250	400	500
7.	Editing, coding, punching, tabulating	450	800	1,300
8.	Telephoning	-	100	200
9.	Mailing	10	25	100
10.	Analyzing data and report writing	-	150	500
11.	Reproducing report	25	100	300
	Total	$5,935	$11,325	$19,900
	Average cost per interview	$11.87	$22.65	$39.80

Note. From An Introduction to Sample Surveys for Government Managers, by C. H. Weiss & H. P. Hatry. Washington, D. C.: Urban Institute, 1971, p. 42.

Response Rate

Krueck (1975) in his follow-up method comparison study reported that his data indicated the mailed questionnaire and personal interview methods were approximately equal in effectiveness, eliciting response rates of about 50%.

Parten (1950), however, stated that the most striking feature of the personal interview method was the high percentage of acceptable returns obtained, especially in well organized and carefully planned studies (p. 73). She reported that in studies of the general public, most surveys could depend on at least 80% response. Though Parten stated the response rate was usually high, Denton et al., (1977) reported the use of personal interviews reduced the number of individuals who could be surveyed due to the time and expense involved in conducting personal interviews (p. 7). Therefore, according to Denton et al., (1977), the personal interview method may have a higher response rate, but the size of the sample or population was usually smaller than other methods of follow-up.

Baugh conducted a study in 1976 where he used both mail questionnaires and personal interviews. His response rate for the mail questionnaire section of the study was 55%, but he had a 100% response rate for the personal interview. Mayer (1974) stressed that the personal interview has the highest potential response rate.

Length of Time

A follow-up study consisting of personal interviews usually takes a longer period of time to complete than either a telephone survey or mail questionnaire. Cox (1966) disagreed with the majority of researchers

when he stated, "given a tight schedule, a researcher would expect to turn to the personal interview method, usually at greater cost" (p. 392). Denton et al., (1977) stated the more popular view when he reported the personal interview to be time consuming. Jackson and Rothney (1961) performed a comparison of the mail questionnaire and the personal interview follow-up methods and found the mail questionnaire had the advantage of saving time over the personal interview.

Dillman (1978) reported that the time involved in a personal interview study varied depending on the sample size and geographical dispersion (p. 68). He further stated that the time required was closer to that required for mail questionnaire studies than telephone surveys (p. 68).

Krueck (1975) reported that the average time for conducting a follow-up personal interview in his study was 20 minutes. He calculated 12 hours of clerical time was spent in planning and assimilating various pieces of information relating to the personal interview. Totally, 116.5 manhours were required for the completion of approximately 80 interviews (p. 24). Weiss and Hatry (1971) reported that the personal interview took time for recruiting and selecting interviews as well as training before the interviews could begin (p. 20).

Parten (1950) reported that the time required to cover a large population with personal interviews may make the method undesirable. She also pointed out that the personal interview usually takes more time than the telephone interview.

Basically, the time required for a personal interview, as for all methods, depended on the number of responses desired. In a very large

sample, using a mail questionnaire, Parten (1950) reported that a personal interview may be required eventually to check for nonresponse bias in the mail questionnaire (p. 96).

Mayer (1974) reported that the personal interview survey had the longest and most complicated scheduling requirements. According to Mayer, "The scheduling and timing requirements of personal interview surveys were the chief reasons why this method of data collection was the slowest" (pp. 2-84 - 2-85).

Personnel Required

As McKinney and Oglesby (1971) reported, the personal interview method of follow-up was not only expensive, but required a great amount of staff time. Whether it was staff that was presently employed, or staff that must be hired and trained, this method of follow-up was a time consuming process.

The main reason personal interviews required such a large staff was that all interviews must have a staff member present, or it was not a personal interview. Parten (1950) reported that the organization required for selecting, training, and supervising a group of interviewers working in the field was more complex than that needed for surveys conducted by other methods of follow-up (p. 81). Interviews of working people required an even larger staff since those interviews had to be conducted at certain hours in the evening.

Dillman (1978) reported that personnel requirements for the personal interview were the most difficult to meet. "The availability of people with interviewing and supervisory skills is as low as the cost is high" (p. 66). Supervisory networks should be extensive for control. Therefore, the size of the study would have a direct effect on the number of

people required to perform a personal interview study. In most cases, the personal interview study required a larger staff than either the mail questionnaire or the telephone survey (p. 66).

Quality of Data

The quality of data produced through personal interviews had been both praised and criticized. McKinney and Oglesby (1971) suggested that probably the most desirable kind of follow-up was the personal interview, because it provided the opportunity for the respondent to ask questions for clarification as well as for the interviewer to ask questions for deeper insight into the problems of occupational preparation as perceived by the respondent (p. 7).

Gordon (1975) stated that the personal interview provided more opportunity to motivate the respondent to supply accurate and complete information immediately (p. 76). He also stressed the personal interview provided more opportunity to guide the respondent in his/her interpretation of the question, allowed greater flexibility in questioning the respondent, allowed greater control over the interview situation, and provided a greater opportunity for evaluation of the validity of the information through observation of the respondent's nonverbal responses (pp. 76-77).

Parten (1950) reported that the personal interview data was more correct than that secured by other methods since the interviewer could clarify seemingly inaccurate answers by explaining the questions to the respondent (p. 9). Interviewers could also be trained to spot falsified responses or could collect supplementary information about the respondent if the responses indicated a need for more data (p. 80). Another advantage of data collection with the personal interview was

that visual cues could be utilized. However, the danger of interviewer bias had to be considered as well.

Parker, Wright, and Clark (1957) performed a study where college students were interviewed concerning their scholarships, and the interviews were recorded. A "check interviewer" listened to the recordings and was asked both what the student said, and what they interpreted the student as saying. An interesting result of their study was that the two interviewers, the one who performed the interview in person and the one who listened to a recording, did not always agree on what the student actually said. Overall, the results from this study indicated that the personal interview does not yield 100% reliable data. However, they asked, "Can we afford the time and expense to train interviewers when questionnaires or similar techniques can only be slightly less reliable?" (p. 220).

Herbert Hyman (1950) was concerned with the effect of the interviewer on the quality of data gathered during a personal interview. A two year study was done at the National Opinion Research Center to isolate, measure and control the interviewer effects on the respondent. It was thought that the respondents answers were affected by the personality or characteristics of the interviewer. One of the findings of the study was that interviewers would report differently even if the response was the same. Hyman used a recorded interview and found differences between interviewer reports of the same responses, suggesting differences between interviewer reports could cause inconsistencies without including the aspects of respondents' answers. Next, the study viewed the respondent and found respondents gave different responses

regardless of whether an interviewer was present or not. Therefore, some of the inconsistencies came only from respondents. These two possible biases, and the interaction that may exist between them concerned most users of the personal interview method of follow-up.

The Hyman (1950) study also reported the other view; some respondents might not be affected by interviewer bias at all. The study reported that a few respondents could not even recall what the interviewers looked like, and for such respondents, the interviewer respondent interaction was minimal. However, according to Hyman, a series of other studies showed that survey results for specialized attitudes are affected by the disparities or similarities in the group membership of interviewers and respondents. He reported that there was documentation to show that responses varied with the disparity between the interviewer's and respondent's sex, class, color, religion, and other group membership factors. This suggested that respondents perceived something about the interviewer immediately from his or her appearance or behavior, interpreted this for some reason in a certain way, and in turn, altered their behavior. On the other side, the interviewer perceived the respondent and subsequently altered his or her method of questioning, probing, and recording. Interviewers were found to have certain expectations about how the respondent would respond and these expectations affected how he or she would probe for answers and record them.

To minimize interviewer effect, interviewers were usually required to ask questions exactly as they were written, so all questions would be asked with the same wording. Training of interviewers was given to eliminate interviewer bias as much as possible, but it was still a

recognized problem with the personal interview method (Dillman, 1978, p. 63).

Parker, Wright, and Clark (1957) reported on several studies which supported the reliability of personal interviews. They reported that Anderson (1954) found a 0.85 level of consistency in ratings when a personal interview was used. Levin (1954) concluded that short interviews (about one hour in length as opposed to two or two and a half hours) produced more reliable data than longer interviews.

In regard to completeness of data collected by the personal interview method, Krueck (1975), in his comparison study, found that the personal interview method had a much lower frequency of no response to individual questions than did the mail questionnaire method.

Jackson and Rothney (1961) performed a study which found that personal interviews elicited significantly more complete answers than the mail questionnaire. The personal interview also elicited a greater number of responses than the mail questionnaire.

The personal interview method was found to produce more socially desirable answers than either the telephone survey or the mail questionnaire. Hochstim (1967) concluded that generally respondents were most honest in mail surveys, least honest in personal interviews, and intermediately honest in the telephone surveys. Dillman (1978) supported the idea that personal interviews have the highest probability for producing socially desirable answers as opposed to accurate answers. Dillman (1978) stated "The greatest advantage of the personal interview--the physical presence of the interviewer--may at times be its greatest drawback" (p. 63).

Parten (1950) listed the advantages of the personal interview as follows:

1. The personal interview usually yields a high percentage of response, for most people are willing to cooperate.

2. It can be made to yield an almost perfect sample of the general population because practically everyone can be reached by and can respond to this approach.

3. The information secured is likely to be more correct than that secured by other techniques once the interviewer can clear up seemingly inaccurate answers by explaining the questions to the informant. If the latter deliberately falsifies replies, the interviewer may be trained to spot such cases and use special devices to get the truth.

4. The interviewer can collect supplementary information about the informant's personal characteristics and environment which is invaluable in interpreting results and evaluating the representativeness of the persons surveyed.

5. Scoring and test devices can be used, the interviewer acting as experimenter.

6. Visual material to which the informant is to react can be presented.

7. Return visits to complete items on the schedule or to correct mistakes can usually be made without annoying the informant. Thus greater numbers of usable returns are assured than when other methods are employed.

8. The interviewer may catch the informant off guard and thus secure more spontaneous reactions than would be the case if a written form were mailed out for the informant to mull over.

9. The interviewer can usually control which person or persons answer the questions, whereas in mail surveys several members of the household may confer before the questions are answered. Group discussions can be held with the personal interview method if desired.

10. The personal interview may take long enough to allow the informant to become oriented to the topic under investigation. Thus recall of relevant material is facilitated.

11. Questions about which the informant is likely to be sensitive can be carefully sandwiched in by the interviewer. By observing the informant's reactions, the investigator

can change the subject if necessary or explain the survey problem further if it appears that the interviewee is about the rebel. In other words, a delicate situation can usually be handled more effectively by a personal interview than by other survey techniques.

12. More of the informant's time can be taken for the survey than would be the case if the interviewer were not present to elicit and record the information.

13. The language of the survey can be adapted to the ability or educational level of the person interviewed. Therefore it is comparatively easy to avoid misinterpretations or misleading questions.

Parten (1950) listed the disadvantages of the personal interview as follows:

1. The transportation costs and the time period to cover addresses in a large area may make the personal interview method unfeasible.

2. The human equation may distort the returns. If an interviewer has a certain economic bias, for example, he may unconsciously ask the questions so as to secure confirmation of his views. In opinion studies especially, such biases may operate. To prevent such coloring of questions, most opinion surveyors instruct their interviewers to ask the question exactly as printed on the schedule.

3. Unless the interviewers are properly trained and supervised, the data recorded may be inaccurate and incomplete. A few poor enumerators may make a much higher percentage of returns unusable than if the informants filled out and mailed the interview form to survey headquarters.

4. The organization required for selecting, training, and supervising a field staff is more complex than that needed for surveys conducted by other methods.

5. It is usually claimed that costs per interview are higher when field investigators are employed than when telephone or mail surveys are used. This may not be true if the area to be covered is not too great. If the general public in a community is to be surveyed, the costs of securing a representative sample by telephone or mail inquiries will probably equal or exceed the cost by the personal interview method, since in the end personal follow-up will be necessary to round out the sample.

6. The personal interview usually takes more time than the telephone interview providing the persons who can be reached by telephone are a representative sample of the type of population to be covered by the survey. However, for a sample of the general public a telephone inquiry is not a substitute for a personal interview. The lowest income groups often do not have telephones.

7. If the interview is conducted in the home during the day, the majority of the informants will be housewives. If a response is to be obtained from a male member of the household, most of the field work will have to be done in the evening or on weekends. Since only an hour or two can be used for evening interviewing, the personal interview method requires a large staff for studies requiring contacts with the working population. (pp. 79-82)

Computerized Data Retrieval System

The computerized data retrieval system was developed by the Florida Inter-Institutional Research Council (IRC) as an alternative method of obtaining information concerning community college graduates (Miner, 1977, p. 2). According to Norris Miner (1977), the computerized data retrieval system used computer input data containing the graduate's social security number (ssn) and program of study completed. These data were matched by ssn with the third quarter of 1976 Department of Commerce files. The files contained employment data on all persons in the state who were eligible for unemployment compensation. For every match in ssn with graduate files, the number of weeks worked, total wages, and the code for the employer were obtained. The graduate files were then matched by ssn with the State University System (SUS) student master file for term 1 of 1976-77. When a match occurred within the SUS data tape, the university and program of study were obtained.

Member colleges of the IRC decided to compare two alternative methods of follow-up by using both the mail questionnaire method, and the computerized data retrieval method.

According to Miner (1977), a questionnaire was mailed to 443 graduates of Seminole Community College. Then the computerized data retrieval system was performed with a match in ssn being considered a response. Table 7 presents the results of the two studies.

The results showed the improved response rate that the computerized data retrieval system supplied and also showed the more in-depth information supplied by the questionnaire. The computerized data retrieval system will be discussed using the five variables: costs, response rate, length of time, personnel required, and the quality of data.

Costs

Since the costs were related to personnel costs, the costs for the computerized data retrieval system were lower than the other methods of follow-up. Miner (1977) reported that the computerized data retrieval system was less expensive than mailing questionnaires and processing the responses. Preparing the program, gathering the data tape, and using computer time were the major expenses involved. The largest cost was the initial cost of writing the program. After that, occasional updating would allow the program to be functional. The cost of running the computer program was not high, therefore the overall cost was low. Also, since little human time was involved, this method was less expensive than other methods.

Response Rate

The response rate for the computerized data retrieval system in Miner's study was 82.8% compared to the same study done with a mail questionnaire response rate of 56%. The computerized data retrieval

Table 7

A Comparison of a Mail Questionnaire Study and a Computerized Data Retrieval System Study

	Questionnaire	Computerized Data Retrieval
Completion rate	56%	82.8%
Response rate		
Employed	12.9%	42.8%
Advanced education	81.5%	57.2%
Other	5.5%	3.3%

Note. From "The Problem with the Placement Study," by N. Miner, Sanford, Florida: Seminole Community College, 1977, p. 6.

system had several constraints in regard to response. Any potential respondent working or attending school out-of-state would be lost to the study. Also, any potential respondent enrolled in a private school would be lost to the study since neither would be on the two data tapes.

A follow-up of nonrespondents was conducted and Miner (1977) reported that eleven nonrespondents were continuing their education with seven delayed entrants into the SUS. Two were in private colleges and two were in out-of-state colleges. Another five were found to be employed.

The results also demonstrated a response bias in the mail questionnaire. It was found that graduates who continued their education were more likely to responded to questionnaires.

The computerized data retrieval system had a built-in response bias, the loss of responses from out-of-state graduates and private school students. A "point in time" problem was apparent with the computerized data retrieval system also. Some respondents were lost because they delayed one or more school terms before entering the SUS. A longitudinal study utilizing the computerized data retrieval system would eliminate part of this problem.

Length of Time

The length of time needed to prepare a questionnaire, stuff the envelopes, mail them, wait for returns, and analyzed them, made the mailed questionnaire much longer to perform than the computerized data retrieval system. The computerized data retrieval system only waited on the preparation of the data tapes once the program was initially written. It could then be used innumerable times. The actual time needed to run the

program was minuscule once the results had been collected. This made the computerized data retrieval system require the shortest length of time to perform an actual follow-up procedure.

Personnel Required

The only essential personnel for a computerized data retrieval follow-up study was a person to perform the computer programming aspects. The initial program had to be written and tested. Once it was operational, then a computer operator could conduct a run of the program when necessary, and the results would be ready for reporting.

Quality of Data

The data used in the computerized data retrieval system were data supplied by college records and data supplied by the Department of Commerce. Miner (1977) reported that this eliminated any errors introduced through self-reported data. Therefore the follow-up study results were based on data that were as accurate as the college records and the government employment records.

In regard to completeness of response, the computerized data retrieval system reported only the employer occupational code rather than the occupational code of the respondent. Therefore, as Miner stated in his report, the computerized data retrieval system did not provide direct information on related and nonrelated employment to program of study. This imposed a lack of completeness with regard to employment relating to program of study. The employer code, in some, but not all instances, supplied sufficient information to determine the area of respondent employment, and whether or not the area was related to the programs of study at the college.

CHAPTER 3

RESULTS

Comparing different information collecting survey techniques has been recognized as a difficult task. Dillman (1978) stated:

> The question of which method is best cannot be answered in abstract terms. Although each method has certain strengths and weaknesses, they do not apply equally, or sometimes at all, to every survey situation. Thus, until the attributes of each method are considered in relation to the study topic, the population to be surveyed, and the precise survey objectives, the question of which is best cannot be answered. (p. 39)

Table 8 is a replication of a table from Dillman's book Mail and Telephone Surveys (1978). This book offers a comparison of mail questionnaire, telephone survey, and personal interview methods of conducting a survey. The table lists the ratings of performance characteristics for each of the three traditional survey methods as high, medium, or low. This allows the researchers to find the performance characteristics important for a particular study and observe which survey method is high or low in those important characteristics. Each survey will have some characteristics which are more important than others. The survey method chosen should have a high rating in as many of the important performance characteristics as possible.

With the recognition of the difficulty of comparing follow-up methods, this section will present a comparison of four methods of follow-up based on the five criteria previously derived from the Review of Related Literature. An analysis of the advantages and disadvantages, and

Table 8

Performance Characteristics Rating for Personal Interviews (Face-to-Face), Mail Questionnaires, and Telephone Interviews

Performance Characteristics	Face-to-Face Interviews	Mail Questionnaires	Telephone Interviews
I. Obtaining a Representative Sample.			
A. Known opportunity for all members of population to be included in the sample.			
1. Completely listed populations.	High	High	High
2. Populations which are not completely listed (e.g., household occupants).	High	Medium	Medium
B. Control over selection of respondents within sampling units.	High	Medium	High
C. Likelihood that selected respondents will be located.	Medium	High	High
D. Insensitivity to substitution of respondents and households.	Medium	Low	Low
E. Response rates.			
1. Hetergeneous samples (e.g., general public).	High	Medium	High
2. Homogeneous, specialized samples (e.g., agency directors, ministers, students).	High	High	High

Table 8 - Continued

Performance Characteristics	Face-to-Face Interviews	Mail Questionnaires	Telephone Interviews
F. Likelihood that unknown bias from refusals will be avoided.	High	Low	High
II. Questionnaire Construction and Question Design			
A. Allowable length of questionnaire.	High	Medium	Medium
B. Type of question.			
1. Allowable complexity.	High	Medium	Low
2. Success with open-ended questions.	High	Low	High
3. Success with screened questions.	High	Medium	High
4. Success with controlling sequence.	High	Low	High
5. Success with tedious or boring questions.	High	Low	Medium
C. Success in avoiding item non-response.	High	Medium	High
D. Insenstivity to questionnaire construction procedures.	High	Low	Medium
III. Obtaining Accurate Answers			
A. Likelihood that social desirability bias can be avoided.	Low	High	Medium
B. Likelihood that interviewer distortion and subversion can be avoided.	Low	High	Medium

Table 8 - Continued

Performance Characteristics	Face-to-Face Interviews	Mail Questionnaires	Telephone Interviews
C. Keeping costs low.			
1. Overall potential for low per interview costs.	Low	High	Medium
2. Insensitivity of costs to increasing geographical dispersion.	Low	High	Medium

Note. From Mail and Telephone Surveys: The Total Design Method, by D. A. Dillman, New York: Wiley and Son, 1978, pp. 74-75.

strengths and weaknesses of the four methods have been identified and are presented in Table 9.

Table 9 presents four follow-up methods: the mail questionnaire, telephone survey, personal interview, and computerized data retrieval system. Each follow-up method is evaluated across the five criteria, costs, response rate, length of time, personnel required, and quality of data. Each follow-up method is analyzed in terms of each criterion for strength or weakness in dealing with that aspect of the study. Two criteria not originally chosen for the evaluation were discovered to be interrelated among the follow-up methods and other criteria. They are sample size and geographic dispersion. Their relationships among the criteria and the follow-up methods were also included in Table 9.

Mail Questionnaire

As can be observed from Table 9, one of the advantages of the mail questionnaire is its low cost in relation to the other methods of follow-up. Costs are not strongly affected by sample size, but do relate somewhat to response rate. The lower the response rate, the higher the cost per response. A mail questionnaire study with a high response rate would be expected to have a low cost per response. But, as can be seen in Table 9, one disadvantage of the mail questionnaire is the tendency to have a low response rate. Follow-up techniques, such as those reported in Chapter 2, can increase response rate, but these techniques are costly and their effectiveness variable.

The mail questionnaire requires a moderate time period to perform a study. The literature reports a minimum of two weeks with a second mailing (Cox, 1966). This precludes a short, spontaneous study, but may be used for a planned study with a time period of a month or longer for completion. An

Table 9

Analysis of the Four Methods of Follow-up Based on Five Criteria

Criteria	Mail Questionnaire	Telephone Survey	Personal Interview	Computerized Data Retrieval System
Cost	Low cost. Little relation to sample size.	Moderate cost. Directly related to sample size and geographic dispersion.	High cost. Directly related to sample size, geographic dispersion and personnel required.	Low cost. Little relation to sample size.
Response Rate	Low response rate. Follow-up techniques costly but useful.	High response rate.	High response rate.	Moderate response rate. Limited to in-state sample.
Length of Time	Moderate Time period (few weeks at least). Not affected by sample size.	Short time period. Directly related to sample size, length of interview and number of personnel available.	Long time period. Directly related to sample size, length of interview, geographic dispersion, & number of personnel available.	Short time period. Not affected by sample size.

Table 9 - Continued

Criteria	Mail Questionnaire	Telephone Survey	Personal Interview	Computerized Data Retrieval System
Personnel Required	Few personnel required. Mostly clerical help.	Moderate personnel required. Related to sample size and length of time; some training beneficial.	Extensive personnel required. Directly related to sample size and length of time; extensive training beneficial.	Few personnel required. Specialized computer training necessary.
Quality of Data	Moderate accuracy. Possible misinterpretation, good with sensitive issues, possible response bias.	Moderate accuracy. Moderately sensitive issues, short answers, more condensed.	Moderate accuracy. Interviewer bias, reduce misinterpretation, greater elaboration on answers.	High accuracy. Government information limited to data available on computer tapes.

Note. Low, moderate, and high denote relative conditions rather than absolute conditions.

advantage of the mail questionnaire is that sample size does not strongly affect the length of time needed for the study. The time necessary for mailing and returning 100 questionnaires would not differ greatly from the time necessary for mailing and returning 1000 questionnaires.

Another advantage of the mail questionnaire is that few personnel are required. The director of the study can utilize available clerical help for addressing and stuffing envelopes, therefore minimal training is required. Analysis of results across the four methods would be similar, either manual or computerized, and require equal personnel and skills for equal sample sizes.

The mail questionnaire study procures moderately accurate data. The absence of an interviewer allows for possible misinterpretation of questions. Therefore, questions should be pilot tested and validated before used in a mail questionnaire. When response rate is low, response bias is a possible disadvantage. Response bias results when the respondents in a study differ significantly from the nonrespondents. With regard to quality of data, the mail questionnaire is superior to the other methods when collecting data on sensitive issues. Respondents would be more likely to respond honestly when not faced by another person who might disapprove of socially deviant answers. A disadvantage associated with mail questionnaires is that respondents can skip questions, therefore reducing the data received and complicating analysis.

The type of data collected by the mail questionnaire is also restricted by the format. Written questions are frequently multiple choice to facilitate computer processing and analysis. This limits the possible answers for each question, and therefore limits the kind of data collected. Open-

ended questions can be asked on a written questionnaire, but these require human interpretation for comparison purposes and analysis. This opens the results to possible interpretation errors.

The mail questionnaire is advantageous when dealing with large samples with wide geographic dispersion. Moderate time limits, few personnel requirements, and sensitive data acquisition are also strengths of the mail questionnaire method. The primary disadvantage of the mail questionnaire is the low response rate and possible response bias producing potentially inaccurate or false results.

Telephone Survey

As can be observed in Table 9, the costs of a telephone survey are moderate. The costs are strongly related to the size of the sample and the geographic dispersion. With a large sample, more calls must be made, necessitating either a longer time allowance for study completion, or an increase in personnel (telephone interviewers). If the geographic dispersion of the sample exceeds the immediate area, the long distance telephone calls will increase the costs. Small, geographically confined samples, however, could be performed with relatively low costs utilizing a telephone survey.

An advantage of the telephone survey is that it usually produces a high response rate. The skills of the interviewer can affect the response rate also. Well trained interviewers can produce high response rates and possibly perform public relations promotion at the same time. Another advantage of the telephone survey is that it can be conducted in short periods of time, often requiring only a few days. Depending on the length of the interview, many interviews can be made in one day by a few people continuously placing calls.

Geographic dispersion will not affect the length of time of the study, so the telephone survey can also handle geographically disperse samples in a relatively short time period. The only limitation in the time period to perform a telephone survey is the availability of personnel to place the telephone calls. With adequate personnel, the telephone survey can be done quickly and efficiently.

Personnel requirements are moderate. Telephone interviewers are necessary. If there are no time limits, then only a few personnel can conduct the entire study. The training requirements are low, possibly only an explanation of the interview and the questions to be asked. Telephone interviews for relatively simple questions require few special skills. Part-time people or present employees can be utilized for the study.

The quality of data produced by the telephone survey is moderately accurate. Sensitive issues should be avoided and long complex answers should not be required. Telephone surveys usually produce short, concise answers. If interviewers or questions annoy the respondent, then false answers may be given. But a reasonable, short, nonsensitive subject telephone survey should elicit accurate and complete information.

The major advantages of the telephone survey are that it can be conducted on short notice, and in a short period of time. If the survey is based on a small, local sample, costs will be relatively low, another advantage. Response rates are usually high with the telephone survey, and while personnel are needed to place telephone calls, the training requirements are minimal. The telephone survey can, to some extent, combine the advantages of the personal interview and the mail questionnaire.

It has the high response rate and personal communication associated with the personal interview, but also has somewhat lower costs and fewer personnel requirements associated with the mail questionnaire. In many data collecting instances, it can be used as an effective compromise between the two methods.

The telephone survey is at a disadvantage when operating with large samples and extensive geographic dispersion. These variables can increase costs, length of time for completion, and personnel requirements. The quality of data is generally accurate, but interviews over the telephone should be shorter than personal interviews, no longer than 20 to 30 minutes, and should be limited to questions which elicit simple answers. The telephone survey can be advantageous as long as the interrelationships between costs, length of time, sample size, geographic dispersion, and personnel requirements are considered.

Personal Interview

Again from Table 9, one of the major disadvantages of the personal interview method is the high cost. Costs are directly related to sample size, geographic dispersion, and personnel requirements. Sample size determines the number of interviews to be performed and each interview usually requires an interviewer to travel to the respondent, perform the interview, and organize the information. Travel and manpower therefore increase the expenses associated with the personal interview. An advantage of the personal interview is the response rate, which is usually high due to the personal attention of an interviewer visiting the respondent. It has been shown that it is difficult for a potential respondent to refuse an interview or ask an interviewer to leave. Therefore, with

personal interviews, the costs are high, but so are the response rates.

Another disadvantage of the personal interview to be considered is the length of time required to complete the study. The necessity of traveling to respondents reduces the number of interviews an interviewer can conduct per day, therefore increasing the length of time necessary to complete the study. The time required is directly related to sample size (the number of interviews necessary), length of the interview, geographic dispersion (the distance the interviewers must travel), and personnel (number of interviewers).

A disadvantage of the personnel requirements associated with the personal interview strategy is the number of well-trained interviewers which are needed to conduct a moderate size study. Interviewers must be present for each interview and usually must travel to the location of the interview. If given enough time, a few interviewers can take several months to cover a moderate size sample. Increases in the number of interviewers can reduce the time to complete the study if personnel and funds are available.

Well-trained interviewers are essential for accurate data collection. The personal interaction between the interviewer and the respondent can affect the type of answers given, the honesty and completeness of the answers, and the attention that the respondent gives the subject. Interviewers who are well-trained can reduce interview bias, if not eliminate it. Also, interviewers can have an effect on response rate by encouraging reluctant respondents to cooperate.

While the quality of data collected is usually complete and detailed for the personal interview, there is always the danger of interviewer

bias; i.e., the interviewer affecting the responses elicited from the respondent. This reduces the accuracy of the data collected. The personal interview is limited in the collection of sensitive data due to respondents tending to give socially acceptable answers when face to face with an interviewer. One advantage the personal interview does possess, is that the presence of the interviewer allows the respondent to ask questions and therefore clarify any misinterpretations or misunderstandings. The interviewer can also encourage the respondent to answer all questions, thereby producing a complete interview. The personalization of the interview can also bring about respondent involvement with the subject of the study.

The overall advantage of the personal interview is the depth and complexity of questions and answers which can be incorporated into the interview due to the personal interaction. The personal interview can produce the most thorough information of all the methods. It is this advantage which may cause researchers to use the personal interview method regardless of the costs and time involved.

Although the personal interview has many disadvantages, the advantages of in-depth, complex, and detailed data encourages many researchers to utilize this method of data collection. Due to the disadvantages, high costs, lengthy time periods, and extensive personnel requirements, personal interview studies usually employ small samples. The high response rate, another advantage of the personal interview method, also supports the small sample size since almost 100% response rate can be obtained with the personal interview method.

Computerized Data Retrieval System

The computerized data retrieval system has many advantages as can be seen in Table 9. Costs are usually low, and are not greatly increased by increases in sample size. The response rate of the computerized data retrieval system is dependent on the number of in-state respondents. A study involving large numbers of out-of-state respondents would not produce a high response rate, unless similar data tapes could be obtained from all states in which the respondents resided. Therefore, response rate is directly related to the location of the respondents. If they are located in an area included in the data tape, then the response rate will be high.

The computerized data retrieval system can be conducted in a short time period. Once the data tapes have been built, collected, and merged, the only remaining need is for a computer program to produce the desired information. The short length of time is an advantage of the computerized data retrieval system for planned, systematic follow-up.

Limited personnel requirements are also an advantage of the computerized data retrieval system. Aside from the director of the study, the only personnel required are specialized data processing personnel.

Assuming that government collected data are accurate, then the information produced by the computerized data retrieval system will also be accurate. The major disadvantage of the computerized data retrieval system, and the reason it cannot be used for a number of studies, is the limited kinds of information available. The information that can be produced is constrained by the data available from the State Department of Commerce data tapes. Therefore, if the type of information desired is offered on the Department of Commerce data tape, then the computerized

data retrieval system will be advantageous. Otherwise, one of the other methods of data collection will be necessary.

Due to the ease of performing the computerized data retrieval system, the information can be collected to be used in collaboration with other studies, or be used for validation purposes.

Vocational Education Follow-up Studies

Follow-up studies for vocational programs at the community college level usually concentrate on collecting information from graduates who are working in the field, and the employers of these graduates. Follow-up studies of graduates can encompass a large range of information. Such information can include length of time between graduation and employment, field of employment, difficulty in obtaining employment, type of employment obtained, salary, promotion history, and satisfaction with the job. This information can be useful for answering questions associated with accountability of vocational education programs of community colleges. Graduates' evaluation of their education program provides useful feedback for the improvement of vocational programs.

Employers of graduates are also a source of valuable information about graduates' preparedness for employment and evaluation of graduates' performance on the job. Information collected from employers can be useful in meeting the educational and occupational needs of the community.

The four survey methods were compared, using the five criteria previously discussed, to discover the best method or methods for performing community college vocational follow-up studies. Since Dillman (1978) stated that the different survey methods need to be compared in a defined situation, the comparison was made for the two most likely situations

requiring follow-up studies for community college vocational programs. Presented first are the evaluations and recommendations for follow-up studies of vocational graduates from the community college, and second are the evaluations and recommendations for follow-up studies of employers of vocational graduates.

Follow-up Study of Vocational Program Graduates

Costs. Baugh (1976) compared the costs associated with a mail questionnaire study and a personal interview study. From Table 3, the cost of 7,780 responses was $8.20 per response with computer processing for the mail questionnaire method, and $28.67 per response for 271 responses for the personal interview method. The Weiss and Hatry (1971) study compared costs of mail questionnaire, telephone survey, and personal interview studies and found the mail questionnaire study cost the least per response, the personal interview study cost the most per response, and the telephone survey study fell between the two. Their results are displayed in Table 10.

Researchers generally agree that the mail questionnaire is the most economical of the three major survey methods. Recent research has suggested that when the response rate of the mail questionnaire is low, the telephone survey can compete economically based on cost per response. Personal interviews are recognized as the most expensive usually because of the manpower and travel costs. In the cost of the computerized data retrieval system, Miner (1977) reported that it would be even less expensive than the mail questionnaire.

What will be the cost of performing a follow-up study on vocational graduates? The college should have records of addresses and telephone

Table 10

Comparison of Cost for Different Sample Sizes and Methods

	Total cost	Approximate cost per response
Personal interview		
Sample of 400	$ 9,925	$24.80
Sample of 500	11,325	22.65
Sample of 1,000	19,550	19.55
Telephone interview		
Sample of 500 (including 50 in-person interviews)	8,510	17.00
Mail questionnaire		
2,000 mailed 1,000 returned (supplemented by 50 telephone and/or in-person interviews)	8,475	8.10

Note. From An Introduction to Sample Surveys for Government Managers, by C. H. Weiss & H. P. Hatry. Washington, D. C.: Urban Institute, 1971, p. 33.

numbers readily available for a mail questionnaire, telephone survey, and personal interview study. The college should also have available student social security numbers for the computerized data retrieval system. Bogue (1950) reported that most of the community college graduates would remain in a radius of at least 75 miles from the college from which they graduate (p. 45). Therefore, for those who have stayed in the vicinity of the college, any of the methods of follow-up would seem to be feasible without undue increase in normal operating costs. But reaching the graduates who have left the area would greatly increase the costs of telephone surveys or personal interviews. The computerized data retrieval system would lose data on graduates who left the state. The mail questionnaire would have equal costs for local resident graduates and for distant ones.

Therefore, one consideration for researchers conducting a follow-up of graduates is the response rate they wish to achieve. Another consideration is the cost that might be incurred to achieve that response rate. For the highest response rate at the lowest cost, the computerized data retrieval system would be best. The amount of data gathered, though, would be limited and will be discussed in the Quality of Data section. When considering the economic advantage of the mail questionnaire, the response rate disadvantage must also be considered. The techniques most often used to increase the response rate of the mail questionnaire will cause the costs to go up. If the costs increase enough, then the telephone survey or the personal interview method may be more efficient when one considers their higher response rates.

Another consideration related to cost is the size of the sample.

The mail questionnaire study's sample size may be increased with small increases in costs, but with the telephone survey and the personal interview methods, cost increases are larger for increases in sample size. The computerized data retrieval system is only marginally affected by sample size in relation to costs since the marginal data processing time represents only a fraction of a cent per marginal increase in sample size.

When considering the cost of performing a follow-up study of vocational graduates, researchers conducting the study must set cost limits and then determine which methods can be employed within these limits and which ones cannot. Generally, the computerized data retrieval system offers the lowest cost, followed by the mail questionnaire. The telephone survey can be low in cost if college personnel already employed are available to perform the study, and if the respondents are, for the most part, local residents. The personal interview method will usually have the highest costs. After determining cost delimiters, researchers must then consider the response rate desired since it is related to cost.

Response rate. The mail questionnaire has the lowest response rate of the four methods of vocational graduates follow-up while the personal interview method is recognized as having a high response rate. The telephone survey and computerized data retrieval system also have high response rates. The telephone survey's response rate often depends on the number of "call backs" that will be made until the response is obtained, and the computerized data retrieval system's response rate is limited to responses from graduates who remain in the state.

There are many methods discussed in the literature which are used to

increase mail questionnaire response rates. Following is a list compiled by Dillman (1978, p. 6):

1. Advance notification by letter or telephone that a questionnaire is being sent.
2. White or off-white stationery.
3. More expensive methods of delivering mail, i.e., airmail and certified delivery.
4. Denomination of stamps.
5. Inclusion of stamped return envelopes.
6. Shorter questionnaires.
7. Attractive questionnaire layout.
8. Official sponsorship of survey.
9. Personalization of correspondence.
10. Addition of title under sender's name.
11. Anonymity and confidentiality.
12. Cover letter's composition: permissive (versus firm), long and reasoned (versus short and punchy), a plea for help (versus offer of reward), a request for favor, stress on social usefulness of study, and importance of respondent to study success.
13. Offers of incentives, including money, trading stamps, lottery tickets, survey results, instant coffee, pencil, tie clip, and note pad.
14. Enclosure of incentive (versus promise).
15. Use of repeated follow-ups by mail and/or telephone.
16. Timing of follow-ups.

Most of these methods were discussed in the Review of Related Literature (Chapter 2). In many instances there were both opponents and proponents to each technique. Again, it appeared that different techniques might work in certain situations, but they were not dependable to increase

response rate in all studies. Kanuk and Berenson (1975) reported that there is no strong empirical evidence favoring any technique other than repeated follow-ups and the use of monetary incentive (p. 451).

The telephone survey with call-backs to "no answers" and "busy signals" will usually produce a high response rate. The weakness of the telephone survey for the follow-up of graduates is that the telephone number may be that of parents where the graduates resided before graduation, but have since moved. Parents may not wish to give telephone numbers, or location of graduates who have moved, thus eliminating respondents from the study. Both problems could reduce the response rate of the telephone survey of vocational graduates or increase time and cost of obtaining valid telephone numbers. When performing a personal interview, the interviewer is most successful if an appointment is made with the respondent, but problems similar to telephone survey methods noted above may be encountered. The mail questionnaire has the advantage in that the parents or the post office can forward the questionnaire to the new address of the graduate. While the computerized data retrieval system elicits very high response rate, it cannot reach 100% because data for graduates who live out-of-state are not available. Considering the substantial response rate in relation to the low cost, this method could be the most efficient if the loss of out-of-state residents was not believed to be a significant constraint.

Overall, the personal interview method is recognized as obtaining the highest response rate followed closely by the telephone survey and the computerized data retrieval system. The mail questionnaire method is recognized as being the lowest in response rate.

Length of Time. The computerized data retrieval system can be conducted in the shortest amount of time with the least effort. The telephone survey can be completed in a shorter time period than the mail questionnaire, and the mail questionnaire can be completed in a shorter time period than the personal interview. The time required for the telephone survey and the personal interview methods are very much affected by sample size while the mail questionnaire and the computerized data retrieval methods are not so affected. The personal interview time limits are also affected by the geographic dispersion of the sample.

Regarding a follow-up study of vocational graduates, the college can usually plan far enough in advance to perform a study that is not constrained by time. In that case, almost any of the four methods would be feasible, since given enough time, all four can be completed. Under a time constraint, however, the computerized data retrieval system, or the telephone survey would be the fastest method available to conduct such a study. The mail questionnaire, assuming the questionnaire development did not require a great deal of time, could also be conducted in a relatively short period of time by scheduling repeat mailings only seven days apart. The time period recommended for receiving responses to a mail questionnaire was approximately eight weeks, but can be conducted in less time given one's acceptance of the associated delimiters. A telephone survey can be conducted in a few days, but sample size is a factor that must be considered. A personal interview study can be performed in a few weeks, depending again on the sample size. A computerized data retrieval system study can be done in a few days if the data are available on tape and a computer is accessible.

The telephone survey has long been recognized as requiring a shorter time period to gain responses, but the size of the sample could affect the time involved. A large sample could increase the length of time required to perform the study to such a degree that the mail questionnaire, less affected by sample size, would be more feasible when operating on a tight schedule. Also affecting the telephone survey and the personal interview methods is the availability of personnel which will be discussed in the following section.

To conduct a follow-up study for vocational graduates, the computerized data retrieval system and the telephone survey are recognized as operating well within a short time period. The mail questionnaire can operate in a medium time period, but the personal interview, unless a very small sample size is utilized, usually requires a longer time period.

Personnel Required. With regard to the number of personnel needed to conduct a vocational graduates follow-up study, the computerized data retrieval system requirements are small; mainly computer operators, a programmer, and someone to analyze data and write the report. Most colleges have these personnel readily available. The mail questionnaire method also requires a limited number of personnel; mostly clerical help which again most colleges have readily available. One person directing the study, making decisions, analyzing data, and writing the report, with sufficient clerical help, can efficiently conduct a moderate size mail questionnaire study.

Personnel requirements change when one considers the telephone survey and the personal interview. Both require additional personnel for telephoning or for interviewing respondents, and additionally require some training and supervision. The telephone survey requires limited training

and supervision, and control is not difficult to maintain when all callers are located at one central location. The personal interview method requires interviewers who are well-trained, and supervision is difficult to perform because their activities are largely independent. The better trained interviewers are more expensive but the quality of data is improved, again showing the interrelationships among the variables. The personal interview also requires the same clerical assistance as the other methods.

Geographic dispersion of respondents can affect the personnel requirements for the personal interview. Also, the size of the sample can affect the personnel needs of both the personal interview method and the telephone survey. Personnel requirements for the mail questionnaire would be only marginally affected by a larger sample, e.g., more envelopes to be prepared, but generally the increase in work-load associated with sample size would be less than that associated with either the telephone survey or the personal interview method. Personnel requirements of the computerized data retrieval system are unaffected by increases in sample size.

Krueck (1975) had disagreed with the general consensus that the mail questionnaire study required fewer personnel. The mail questionnaire does require clerical assistance to stuff envelopes, print questionnaires, apply stamps, and address envelopes, but this seldom requires a great deal of training. Most community college research directors would have part-time student assistants available for this type of work while they might have more difficulty finding and training people to perform interviews. Therefore, in the community college setting, it

would seem that existing personnel are available to support the mail questionnaire study as opposed to the telephone survey or personal interview methods.

Overall, the computerized data retrieval system requires the least number of qualified personnel with the mail questionnaire requirements being similar in number. The telephone survey and the personal interview methods not only require greater numbers of personnel than the above two methods, but the training necessary is more extensive, especially with the personal interview method.

Quality of Data. When consideration is given to accuracy of the data collected by the various methods of follow-up, each method is noted to have its limitations. The mail questionnaire may be inaccurate due to response bias from inaccurate responses either intentional or through misinterpretation of questions. The telephone survey may also suffer from similar bias or from interviewers or respondents trying to hurry through the questions. Misinterpretations can frequently be clarified over the telephone. The personal interview method may suffer from interview bias. The interviewer can affect the results through his or her own biases. Misinterpretation can usually be clarified by the interviewer and intentional wrong answers can sometimes be detected by the interviewer. Respondents in personal interviews also tend to answer sensitive questions with more socially desirable answers than with the other methods. The computerized data retrieval system has its results based on Department of Commerce data and information collected from the state university system. While the data are probably the most easily verified, there is still the chance that some inaccuracies are present.

When deciding which method is best in reporting accurate data, the computerized data retrieval system would probably be first choice since it is based on government data subject to audit.

Consideration must also be given to the kind of data being collected. Each method acquires some types of data better than others. The mail questionnaire, with promise of anonymity, is best at collecting data on sensitive issues where the presence of another person might constrain a respondent. The written format of the mail questionnaire does limit the complexity of questions which can be asked. The telephone survey and the personal interview can alleviate the problem of misinterpretation, but will include some restraint felt by people when discussing sensitive questions openly with another person. The telephone survey will also elicit shorter answers and, therefore, does not probe the more difficult or complex questions that the personal interview can cover. The personal interview can cover wide topical areas and complex questions much more efficiently than the other methods. The computerized data retrieval system can collect accurate data, but the type of data is severely limited to that collected by the Department of Commerce and available from college records.

The type of data required for the follow-up study of vocational graduates will often dictate what method one chooses to employ. A community college may wish information on graduates' work classification, who the graduates are employed by, their salary, how long they have been working, and what type of job they are performing. This type of information can best be collected using the Department of Commerce data tape and the computerized data retrieval system. The mail questionnaire could also

collect this information but the information concerning salaries might not be reported as accurately by the graduates as by the Department of Commerce. The same would hold true for the telephone survey and the personal interview. For information concerning the graduates' opinions on training received at the college and preparedness for employment, the follow-up method must include some evaluation. This information cannot be obtained by the computerized data retrieval system. The mail questionnaire, telephone survey, or personal interview would be possible choices although in-depth discussions of the program and its strengths and weaknesses, including areas for improvement, would require a personal interview to obtain maximum accuracy and efficiency.

With regard to completeness of data, the mail questionnaire often encounters the problem of respondents refusing to answer certain questions. The telephone survey and the personal interview offer the opportunity for the interviewers to encourage the respondent to answer. The latter two have been observed to obtain the most complete answers. The personal interviews elicit longer answers, but the telephone survey usually collects more concise information. The computerized data retrieval system cannot always collect complete information. It is limited to the information available for machine processing, and it also loses all out-of-state cases. If the researcher requires information other than that offered on the Department of Commerce tape, or the out-of-state respondents are a significant part of the sample, then the computerized data retrieval system must be eliminated, or used in conjunction with another method.

In the situation of a vocational graduates follow-up study, the purpose of the study would determine the data required. The data requirement

would then help determine the data collection method. For accountability, finding the number of graduates who are employed, their salaries, and type of work performed, the computerized data retrieval system would be adequate. When evaluation and opinions of the graduates are sought, then the mail questionnaire or the telephone survey would be needed. For very complex and in-depth questions, the personal interview method would be the best choice.

Vocational Graduates Follow-up Summary

Four widely used methods of conducting follow-up studies have been compared on the basis of five criteria to discover the strengths and weaknesses of each method for performing a follow-up study of vocational graduates of community colleges. Table 11 displays ratings from these comparisons. Each follow-up method is rated superior, good, fair, or poor. The ratings are based on how well each method relates to each of the five criteria. Example: a superior rating on cost means that method is low in cost, a superior rating on response rate means that method is high in responses, a superior rating on length of time means that method can be conducted in a short period of time, a superior rating on personnel required means that method requires few personnel, while a superior rating on quality of data means that method elicits very accurate and complete data.

As seen in Table 11, the computerized data retrieval system has several superior ratings, but suffers from the disadvantage of limited data. This method of follow-up performs well for vocational graduate studies, but can only be used for certain kinds of information. The personal interview method does not rate high for this type of follow-up study unless the response rate would take on more importance than the other criteria.

Table 11

Ratings of the Four Methods of Follow-up Across the Five Qualitative Criteria for Vocational Graduates Follow-up

Variables	Mail Questionnaire	Telephone Survey	Personal Interview	Computerized Data Retrieval System
Cost	Superior	Fair	Poor	Superior
Response Rate	Poor	Good	Superior	Good
Length of Time	Good	Good	Poor	Superior
Personnel Required	Superior	Fair	Poor	Superior
Quality of Data	Fair	Fair	Fair	Good (limited)

The telephone survey rates as generally adequate, but the mail questionnaire rates highest considering the computerized data retrieval system is delimited by the type of data available. The major weakness of the mail questionnaire is in the area of response rate. Depending on the actual study objectives, an optimum solution to a follow-up study for vocational graduates could be a combination of the computerized data retrieval system and the mail questionnaire, or the mail questionnaire and the telephone survey. With these two combinations, the second method could be used as secondary follow-up for nonrespondents of the first method.

Follow-up Study of Vocational Graduates' Employers

Costs. The mail questionnaire and the computerized data retrieval system have previously been shown to be the most economical of the follow-up methods with the telephone survey and the personal interview being the more expensive methods. In the situation of performing a follow-up study on major employers of vocational graduates, cost must be considered in relation to the type of study.

Follow-up studies of employers of graduates do not usually include large sample sizes since the studies concentrate on major employers in localized areas. The telephone survey and the personal interview are both methods which have higher costs directly related to sample size. When operating with small samples, the cost differences between follow-up methods are not as pronounced as when operating with large samples. Therefore, when performing a follow-up study of graduates' employers, the costs associated with the more expensive telephone survey and personal interview methods may not be prohibitively higher than the costs

associated with the mail questionnaire or computerized data retrieval system methods.

Since geographic dispersion of the sample also affects costs, the more centrally located the sample, the lower the costs associated with the telephone survey and the personal interview. With a study of vocational graduates' employers, the sample may be restricted to mostly local employers since most students tend to seek employment near home and school. With minimal geographic dispersion of the sample the costs of the telephone survey and the personal interview will be lower, possibly low enough to compete economically with the mail questionnaire and the computerized data retrieval system.

Therefore, costs of follow-up of employers of graduates can be kept low due to small sample sizes and small geographic dispersion. While the mail questionnaire is the most economical follow-up method when dealing with large samples, a low response rate could increase the cost per response. A small sample surveyed by telephone or personal interview would produce high response rates and could be as economical (or more so) than a small sample mail questionnaire with a low response rate. The cost per response is a plausible standard for comparing costs across follow-up methods. The computerized data retrieval system is inexpensive, not affected appreciably by sample size, and has a high response rate with an in-state sample, but can only be used to acquire certain kinds of information.

Response rate. Traditionally, the personal interview has produced the highest response rate of the major follow-up methods. The telephone survey and the computerized data retrieval system have produced acceptable

response rates but the mail questionnaire has experienced difficulty in consistently producing an acceptable response rate. The response rate for a follow-up study of employers of vocational graduates would vary depending on the method employed, but since a study of vocational graduates' employers would probably be a relatively small sample, there would be a need for a high response rate in order to obtain reliable results. The loss of a few cases in a small sample can have strong impact on the results. Therefore, a method producing high response would be necessary for this follow-up situation.

The personal interview method would produce the highest response rate. With a small sample almost 100% response is required for reliability. The personal interview method comes the closest to 100% response although wide geographic dispersion may cause it to be inefficient. The telephone survey and the computerized data retrieval system both produce high response rates. The mail questionnaire with multiple follow-up techniques for increasing response rate might be acceptable, but utilizing such techniques might increase the cost to such an amount that an alternative method would be more economical based on cost per response. Therefore, in a study of vocational graduates' employers, the personal interview or the telephone survey would seem to be the best choices for producing the necessary response rate. The computerized data retrieval system would be a possibility depending on the information desired, and the mail questionnaire, although the least adequate, could be used with multiple follow-up techniques.

Length of Time. The telephone survey and the computerized data retrieval system are recognized as follow-up methods which require the

least amount of time to perform. The mail questionnaire requires at least a few weeks. The personal interview is directly affected by the sample size. Holding personnel constant the larger the sample, the longer the length of time required to complete the study. The smaller the sample, the less time required to complete the study. The telephone survey is also affected by sample size though not to the extent of the personal interview. With the smaller sample size expected for a study of employers of vocational graduates, there might not be a substantial time difference between the mail questionnaire and the telephone survey or personal interview.

With proper planning the performance of a follow-up study can be scheduled and arranged taking into account the time necessary for the method chosen. But when time is a constraint, the telephone survey with a small sample could be conducted in the shortest period of time. The mail questionnaire could be done in a few weeks if necessary and, depending on the sample size, the personal interview could be performed in a similar time period. The computerized data retrieval system would also require a short time period, but is limited in the kind of information it can obtain.

Personnel Required. The computerized data retrieval system requires only a few specialized personnel. The mail questionnaire also requires few personnel, mostly clerical assistance to perform the duties associated with preparing the questionnaire for mailing. If the results are to be processed by computer, then keypunch operators and computer personnel are required. The telephone survey and the personal interview require interviewers. The personal interview method requires trained personnel, or must offer some training before the personnel can conduct the interviews.

Interviewers used for telephone surveys require some training, but usually less than is needed for personal interviewers.

When operating with small samples, the telephone survey and personal interview methods still require more personnel than mail questionnaire or computerized data retrieval system methods. The major difference in the numbers of personnel is the need for interviewers. The difficulty in the community college setting could be in freeing personnel to work on the study. Student assistants could be used, or students majoring in areas which include interviewing skills could satisfy the personnel needs of the telephone survey or the personal interview methods. If a college has interviewers available, the additional personnel demands should not differ to a great extent between the methods since most colleges have the other necessary support personnel already employed. If the personnel are not available, then the mail questionnaire or the computerized data retrieval system would be more efficient.

Quality of Data. It was previously noted that each follow-up method has limitations associated with accuracy of data. The personal interview may suffer from both interviewer bias and socially desirable answers. The telephone survey may suffer similar deficiencies as well as short answers. The mail questionnaire may suffer from misinterpretation of questions and incomplete responses while the computerized data retrieval system suffers from a limited data base.

The kind of information desired frequently will determine the method that will be employed. With regard to the employers' of vocational graduates, the information might require adaptation to the employment field. Therefore, different questions might be posed to different employers

thus requiring several printings of a mail questionnaire or different questions for verbal interviews.

How the information will be used will also determine what will be asked. When collecting information to answer accountability questions, information on how many graduates are employed, how long they have been employed, how many were rejected for employement, or relative skill competence would be necessary. When collecting information for internal use, such as program improvement or decision-making, different information, more evaluative in nature, might be required. Such information could include ratings of preparedness for job, performance on the job, and skills and knowledge associated with the job.

Planners of follow-up studies must decide what information they are seeking before they decide which method to use. The mail questionnaire collects information which is restricted to simple or limited answers. Its advantage is its ability to collect accurate answers on sensitive topics due to anonymity. Lacking anonymity, the telephone survey and the personal interview are restricted to nonsensitive subjects to avoid responses which are biased because of respondents' reluctance to be frank when talking with another person about a sensitive subject. With nonsensitive subjects, the telephone survey can collect information on relatively simple topics producing concise information that is limited in complexity and length. The personal interview can collect information on more complex and difficult topics, and elicit longer, more lucid responses, due to interviewer probing into vague answers given by respondents. The computerized data retrieval system can collect salary and employment history, but not evaluative information.

Regarding the follow-up of employers of vocational graduates, the computerized data retrieval system can collect the information concerning length of time of employment, how many graduates are employed, and the salary of graduates, but further information requires that another method be used.

The mail questionnaire could collect some of the information needed for a follow-up of employers of vocational graduates. Information concerning evaluation could be done with a numerical rating scale. Open-ended questions might also be used when collecting information about preparedeness for training. Asking for weaknesses or strengths that the graduates demonstrate on the job would be valuable for internal program improvement. Open-ended questions on a mail questionnaire could collect this information, but for more detail and accuracy, the telephone survey or the personal interview would be needed for complex and in-depth answers.

The telephone survey can collect the complex answers that are needed for a thorough study of the employers of vocational graduates. Some clarification of questions and answers can be made with the telephone survey, but for the most detailed answers, and the least chance of misunderstanding, the personal interview would be the best method. Employers would respond more readily to personal interviewers, especially if possible improvement in the college program was stressed at the beginning of the interview. Employers might see this as an opportunity to gain better trained employees and would probably go into great detail if requested. Having the interviewers present rather than on the telephone would also convince them of the importance of the study and may elicit more suggestions and recommendations from employers.

The personal interview also elicits the most complete data. Employers rushed for time might skip questions on the mail questionnaire or rush answers on the telephone survey, but would respond to a personal interviewer who has gone to the trouble to make an appointment.

A thorough employer follow-up study would probably benefit from collecting data through a personal interview or a telephone survey. The mail questionnaire can be used for a more general study and the computerized data retrieval system would more appropriately be used to gain specific information.

Employers of Vocational Graduates Follow-up Summary

The four methods of follow-up studies have been compared across the five criteria to discover the strengths and weaknesses of each method for performing a follow-up study of employers of vocational graduates. Table 12 presents a summary of this analysis. Each method was rated based on how well each method performs based on each of the five criteria.

As seen in Table 12, each method has both strengths and weaknesses. The personal interview and the telephone survey are preferable over the mail questionnaire and the computerized data retrieval system because more detailed information is gathered. The first consideration in deciding which method of follow-up to use when performing a study of employers of graduates is the kind of information that is desired. Since samples are relatively small, the differences between cost and personnel required across the four methods are reduced. If the sample is large, then cost and personnel requirements will produce substantial differences between the methods, causing the mail questionnaire and the computerized data retrieval system to be the preferred methods. If costs or personnel are

Table 12

Ratings of the Four Methods of Follow-up Across the Five Criteria for the Employer Follow-up

Variables	Mail Questionnaire	Telephone Survey	Personal Interview	Computerized Data Retrieval System
Cost	Superior	Good	Good	Superior
Response Rate	Poor	Good	Superior	Good
Length of Time	Good	Good	Fair	Superior
Personnel Required	Superior	Good	Good	Superior
Quality of Data	Fair	Good	Superior	Poor (limited)

not critical factors, then deciding which method to use can be based on the quality of data and the kind of data needed.

In the stated situation of performing an employer follow-up, assuming a relatively small sample and differences in costs and personnel requirements as not widely different, the personal interview or telephone survey would be recommended methods. In choosing between the two methods, cost associated with the personal interview would be weighed against the loss of detail and thoroughness with the telephone survey. When general information is desired and less detail needed, the mail questionnaire would be an adequate method. The computerized data retrieval system would be adequate if the information desired matched data available through the Department of Commerce data tape.

CHAPTER 4

CONCLUSIONS

Comparisons

The problem of this study was to compare and evaluate selected methods of conducting follow-up studies of graduates of vocational education. Comparisons of the four selected methods of follow-up were found to be difficult due to inconsistencies among the studies and the interrelationships among the criteria.

Inconsistencies among studies were related to sample size, response rate, geographic dispersion, quality of data, and the length of time dedicated for the performance of the studies. Even studies designed to be comparable found difficulties holding response rate constant. Due to the difficulties, comparison studies of follow-up methods are rare and usually inconsistent on one or more criteria.

The interrelationships among the five criteria--costs, response rate, length of time, personnel requirements, quality of data--and the variables sample size and geographic dispersion, complicated comparisons among methods. Costs varied according to sample size, response rate, and personnel requirements. Response rates varied according to the number of subsequent "follow-ups" or "call backs." The length of time varied according to the personnel available, cost expended, sample size, and geographic dispersion. The quality of data varied according to the training and ability of the personnel and the sensitivity of the topic of the

study. This list is not exhaustive, but demonstrates the complexity of the interrelationships among criteria and the difficulty involved in making comparisons based on follow-up studies lacking consistency.

Acknowledging the difficulties, comparisons were made among the four methods based primarily on the relative differences between the five criteria compared across the four methods of follow-up. Table 9 presented the results of that comparison. Following are the conclusions based on those analyses.

Costs

Weiss and Hatry (1971) presented a comparison of costs for studies of mail questionnaires, telephone surveys, and personal interviews, but noted inconsistent sample sizes and response rates. Their results supported the general belief that mail questionnaires produced the least cost per response, telephone surveys produced the next highest cost per response, and the personal interview produced the highest cost per response. Krueck (1975) concurred with these results. Miner (1977) conducted a comparison of a mail questionnaire study and a computerized data retrieval system study by performing both concurrently on the same sample. He found the studies differed on costs, with the computerized data retrieval system being the least costly.

In general, comparing the four methods by cost found the computerized data retrieval system to be the least expensive, followed closely by the mail questionnaire. Next was the telephone survey followed by the personal interview as the more expensive methods of follow-up.

Response Rate

Leslie (1972) concluded that studies of homogeneous populations should not be overly concerned with the percentage of questionnaires

returned. Nevertheless, low response rates continue to be the major criticism of the mail questionnaire. Techniques for increased response rates were discussed in the literature review. Krueck (1975) performed a comparison study of the three methods of conducting follow-up studies and found the telephone survey produced a higher response rate than the personal interview or the mail questionnaire. He reported that the latter two produced similar response rates. Baugh (1976) conducted a study using both mail questionnaires and personal interviews and found that personal interviews produced a 100% response rate while the mail questionnaires produced a 55% response rate. Miner (1977) compared the mail questionnaire to the computerized data retrieval system and found the mail questionnaire produced a 56% response rate while the computerized data retrieval system produced an 82% response rate.

In general, comparing the four methods by response rate, the personal interview was found to produce the highest response rate followed by the telephone survey and the computerized data retrieval system. The mail questionnaire was found to produce the lowest response rate.

Length of Time

Sample size was found to affect the length of time needed to perform a follow-up study. The larger the study, the longer time period necessary for completion of a personal interview or a telephone survey. Mail questionnaires were not affected by sample size to the extent of the previous two methods. Therefore, with a very large study, the mail questionnaire would require less time than a telephone survey or a personal interview. With average size studies, Dillman (1978) stated the telephone

surveys were the fastest to complete. Parten (1950) agreed that the telephone survey can be the quickest of the three follow-up methods. The computerized data retrieval system, due to the advantage of computer processing, could compete with the telephone survey, and for large studies, perform faster. Jackson and Rothney (1961) performed a comparison of mail questionnaire and personal interview follow-up methods and found the mail questionnaire had the advantage of saving time over the personal interview. Cox (1966) reported that the mail questionnaire study could be conducted in a much shorter time period than usually employed by accepting certain inefficiencies.

In general, comparing the four methods by length of time for performance of the study found the computerized data retrieval system to require the least amount of time, followed closely by the telephone survey. A mail questionnaire study could also be conducted in a relatively short time depending on acceptance of certain constraints. The personal interview method was recognized as usually requiring the longest time period for completion.

Personnel Required

The personnel involved with a follow-up study depended on the sample size, geographic dispersion, and the resources available. Parten (1950) reported mail questionnaire studies required less staff and training than other methods of follow-up. Franzen and Lazarsfeld (1945) stated the mail questionnaire required few personnel. Dillman (1978) reported that the personnel requirements for the mail questionnaire were far less than those required for either personal interviews or telephone surveys with equal size samples. He also stated that the personnel

requirements for telephone surveys were less than for personal interviews. The computerized data retrieval system was shown to be conducted with limited personnel requirements. The computer did the work otherwise done by personnel.

Krueck (1975) disagreed that mail questionnaires required fewer personnel than the telephone surveys or the personal interviews. He stated the number of clerical manhours required for mailing preparations increased personnel requirements. These personnel requirements, though, required minimal training and are usually available at educational institutions, while trained interviewers are not.

In general, comparison of the four methods by personnel requirements found the computerized data retrieval system and the mail questionnaire required the least number of personnel, although the computerized data retrieval system did require specialized expertise. The telephone survey required personnel with limited training followed by the personal interview which required the most extensive personnel and training.

Quality of Data

Quality of the data was dependent on the accuracy, completeness, and detail of the data. Parten (1950) believed the mail questionnaire would produce the most accurate data since anonymity was possible. Franzen and Lazarsfeld (1945) agreed that the mail questionnaire elicited more accurate data. Knudson et al. (1967) reported that research comparing mail questionnaires to personal interviews were rare, but the few existing studies indicated the mail questionnaire was more successful in gaining valid data. Hackler and Bourgette (1973) reported the mail questionnaire was more appropriate for collecting socially sensitive data. Krueck (1975)

found socially sensitive data were inhibited in the telephone survey and the personal interview. Hochstim (1967) reported that the personal interview produced the highest number of socially desirable answers, the mail questionnaire the least, and the telephone survey was between the two.

McKinney and Oglesby (1971) suggested the personal interview as the most desirable method of follow-up because it provided the opportunity for clarification and in-depth detail. The telephone survey also offered this opportunity, but on a smaller scale. Payne (1974) reported that the danger associated with the telephone survey and the personal interview was interviewer bias. Parker, Wright, and Clark (1957) reported personal interviews can be reliable. Levin (1954) concluded shorter interviews produced more reliable data than longer interviews. Jackson and Rothney (1961) reported personal interviews elicited more complete answers and drew forth more extensive response than did the mail questionnaire. The data collected from the computerized data retrieval system came from government or college data records, and were therefore considered reliable even though the data are limited.

In general, comparison of the four methods by quality of data found the most detailed data were produced by the personal interview method, followed by the telephone survey. However, both had possible problems associated with interview bias. The mail questionnaire was found best for collecting data about sensitive issues but also suffered from a loss of detailed information. The computerized data retrieval system produced reliable data but was limited in the amount and type of data available.

Evaluation

The primary conclusion of this study is that types of follow-up methods vary in their strengths and weaknesses. Therefore, when evaluating follow-up methods for use in vocational education, the particular needs of each study should be considered. The cost limitations, response rate desired, length of time allowed, available personnel, quality of data necessary, plus sample size and geographic dispersion should all be considered for both their relationship to the follow-up methods and their interrelationships within the follow-up methods.

Data collection methods should be selected based on their ability to perform the objectives of the study. Decisions on the purpose of the follow-up study, the population to be surveyed, and the data needed to fulfill the purpose, should be made prior to method selection. The purpose identifies the data needed and the target population, thus beginning the process of systematically determining the best choice of follow-up method. The costs, response rate desired, time limitations, personnel available, quality of data, sample size, and geographic location can be considered and delimited. The advantages of each method can be weighed to obtain the most effective and efficient method possible under the constraints of the particular situation.

Evaluation of the four methods of follow-up found each method demonstrated strengths and weaknesses. Each method also had advantages and disadvantages associated with certain study situations. Following is the evaluation of the four methods of follow-up and the resulting conclusions for use when conducting information research for community college vocational programs.

Mail Questionnaires

The particular strength associated with the mail questionnaire is that it is superior to the other methods of follow-up in collecting data from large, geographically dispersed populations. The major weakness is a frequently low response rate.

The mail questionnaire has been used extensively for performing follow-up studies for community colleges because of its many advantages. These include low cost, minimal personnel requirements, moderate time restrictions, and relatively accurate data. The mail questionnaire also allows the community college to contact graduates from any geographic location at relatively low cost.

The restriction on colleges utilizing the mail questionnaire are the type of data best collected and the problem associated with response bias. Mail questionnaires can collect data on sensitive issues, but are limited by the necessity of written questions and answers. Open-ended questions can collect more detailed data than multiple choice, but interpretation allows for possible errors. Low response rates can cause biased results when the respondents differ in nonrandom ways from nonrespondents. Community college researchers can utilize techniques for increasing response rate, but their effectiveness is reported to be variable.

In conclusion, the mail questionnaire can be used by community colleges for collecting general information from large numbers of graduates who have geographically dispersed. Vocational students who might have stayed in a central location can also be contacted using the mail questionnaire, but other methods would be just as effective and different data could be collected.

Telephone Survey

The particular strengths of the telephone survey are high response rate and the ability to perform spontaneous short-term studies for small to moderately sized samples. Weaknesses of the method include the possibility of interviewer bias and increased cost in relation to the mail questionnaire.

The telephone survey is suggested as a viable compromise between the mail questionnaire and the personal interview. The telephone survey employs the personal aspects of the personal interview without the inconveniences. It gains the advantages of high response rates and personal interaction for clarity of questions and response. It eliminates travel and the costs of time requirements which accompany it. The telephone survey also exhibits some of the advantages of the mail questionnaire with lower costs due to the personnel being centrally located and by somewhat reducing the personnel requirements. Basically, the telephone survey seems to fall somewhere between the mail questionnaire and the personal interview in ability to collect data under the various constraints.

In conclusion, the telephone survey can be used by community college researchers for collecting more detailed information from graduates than may be gained through mail questionnaires because of the added advantage of the personal approach. It can also do this on short notice and in a short period of time. The telephone survey can also be used by community college researchers for collecting information from vocational graduates' employers, again obtaining somewhat detailed information and possibly including some positive public relations for the community college.

Personal Interview

The particular strength of the personal interview is the ability to collect in-depth, detailed data with a high rate of response. The major weakness is that samples must be kept small due to extensive costs, personnel requirements, and time restrictions.

Personal interview costs are much higher than those of the mail questionnaire or the telephone survey. However, these costs must be balanced against the increase of detailed information obtained with the personal interview. To be confident of the accuracy of the information being collected (at large expense), interviewer bias must be minimized through the hiring of well-trained interviewers.

In conclusion, the personal interview can be used by community colleges to collect detailed and evaluative information from both graduates and employers of graduates. The high degree of detail collected by this method can be useful for program development and planning, and external and internal decision making. The personal interview is also an excellent method to focus employer attention on the community college's vocational programs.

Computerized Data Retrieval System

The particular strength associated with the computerized data retrieval system is the ability to obtain in-state employment history information quickly and inexpensively. The major weakness is that the data and geographic location of respondents are limited.

The advantages of the computerized data retrieval system are that few personnel are needed, most of the work is done by the computer, costs are low because computer time is less expensive than manhours, and the computer

operates at electronic speed. The computerized data retrieval system is limited by the data available on the State Department of Commerce data tapes. This puts definite constraints on the usefulness of the method since the kind of data needed is a primary consideration in planning a follow-up study.

In conclusion, the computerized data retrieval system can be used by community college researchers for collecting information about graduates' employment history, including salary, employment location, length of employment, and industry of employment. When other information is desired by community college researchers, then other methods of follow-up should be employed. The computerized data retrieval system can still be utilized as a supplement to other methods or as a validation measure for information collected through other methods.

Further Research

This study has demonstrated some of the problems associated with vocational programs follow-up studies. An analysis of related literature showed that the recommendations brought forth by investigators in this field are often confusing, contradictory, and/or unverified. This can be attributed to the practice of performing methodological testing as a secondary part of data collection. Seldom have studies been performed primarily to test a particular theory dealing with data collection methodologies. This problem results in studies which are seldom, if ever, exactly replicated for verification, thereby producing confusing and contradictory results.

Berdie and Anderson (1978, p. 1) stated "survey research is desperately in need of systematic study so people can learn to use it correctly

and efficiently." They reported the following from an examination of published research related to survey methodology:

> 1. Different studies investigating the same variable often reported contradictory findings,
>
> 2. few studies reporting promising results have been replicated,
>
> 3. attempts at replication that do exist have often not studied respondents of the same population studied by the pioneer research, and
>
> 4. few efforts have been made to consolidate into useful theories the wealth of data now available. (pp. 1-2)

What is needed is a scientific framework on which to base methodological studies. Research based on scientific theory allows for development of organization and direction. A lack of such theory causes confusion and uncertainties as exhibited in the literature review. Further research into methodologies should concentrate on theory development and following scientific principles of testing and replication.

Researching and validating follow-up methodologies should improve the veracity of the results they produce. The need for further research is open for a wide variety of testing and theory development dealing with follow-up methodologies. Following are some suggested areas for further research into the four follow-up methods analyzed in this study. These suggestions are not intended to be exhaustive, but related to the areas emphasized in this study.

Mail questionnaires were found to be the most widely used method of community college follow-up. Therefore, further research into the weaknesses of the mail questionnaire would benefit educational researchers as well as other users of mail questionnaires.

The major weakness of the mail questionnaire was found to be the low response rate. Low response suggests response bias, which makes questionable

the reliability of the results of a study with a low response rate. This study reported numerous methods by which response rate may be increased. Analysis of the response bias literature showed the effectiveness of these methods to be variable and their usefulness doubtful. Stringent testing of these methods should be performed to discover the conditions under which the methods are useful.

Eliminating response bias by increasing response rate is a prime concern for further research. The crucial question is, how can sample populations be encouraged to return mail questionnaires? One hypothesis dealing with this question is that different populations respond differently to different appeals to return questionnaires. While this hypothesis was mentioned in the literature, little research has been done to substantiate it.

From a study encompassing several different appeals utilizing a random sample of a heterogenous population, one could observe the response rates of each type of appeal from various sub-groups of the population. If certain appeals for questionnaire returns produced different response rates in different sub-groups, the theory would be substantiated. This type of information would be especially beneficial to community college researchers operating within defined populations.

This study found the telephone survey increased in popularity as the number of households possessing telephones increased. The literature reported there was a general feeling among researchers that telephone surveys should be kept short, even though some studies reported successful completion of 25 to 30 minute interviews. Further research into the

optimum time length of telephone surveys could challenge the theory that only short surveys can be performed with the telephone.

The possibility of interviewer bias has been suggested to exist with the telephone survey. The theory that respondents are affected by the presence of an interviewer, even if not physically present but on the telephone, has led to the theory that interviewer bias will exist, though decreased, in a telephone survey. The extent of this bias has not been thoroughly researched and is a potential area for further research.

The personal interview method of follow-up utilized the most extensive human involvement of all the methods examined. Therefore the personal interview deals with the largest amount of unknown factors. Analysis of the literature showed the greatest area of concern was the human factor of interviewer and respondent interaction, or interviewer bias. Some research has been conducted dealing with characteristics which affect respondents. However, more research must be performed before a thorough understanding can be developed. Understanding the interactions which take place between the interviewer and respondent could assist in eliminating or reducing interviewer bias, thus increasing the reliability of personal interview results.

The computerized data retrieval system is recognized as a technique for adding to or verifying information collected through the other three survey methods. It can also be used alone for collecting specific employment information. Being the method with the least human intervention, it theoretically has the least bias. Therefore, this analysis found it to be useful in evaluating the accuracy of specific data collected through the other methods, and thereby checking for biases present in these methods.

The overall need in data collection research is in the area of theory development. The problem is similar to the problems associated with theory development in the social sciences; humans do not conform to standard patterns. But before educational researchers and other researchers use the results of data collection methods to develop theories about human characteristics and actions, they should first develop high quality data collection methodologies verified and validated with scientific methods. Then, with valid data collected through reliable methods, more confidence can be placed on the conclusions based on the results of follow-up studies performed with dependable and accurate data collection methodologies.

APPENDIX

COMMON CORE OF QUESTIONS

Follow-up Survey for Graduates of Two-Year Institutions

1. Name _____
   Last First Middle Maiden, if recently married

2. Sex

   1. Male
   2. Female

3. Race

   1. White
   2. Black
   3. American Indian or Alaskan Native
   4. Asian or Pacific Islander
   5. Hispanic
   6. Non-resident alien (all races)

4. Date of Birth _____ _____
   Month Year

5. What type of award did you receive at _____,
   Name of Institution

   1. Associate degree--college transfer program
   2. Associate degree--occupational-technical program
   3. Certificate or other award

6. What was you program? _____
   (Specify program)

7. As you see it now, after completing your program at _____,
   Name of Institution
   what was your primary purpose for attending this community college?

   1. Exploration of new career or academic areas
   2. Preparation for immediate entry into a career
   3. Preparation for transfer to a four-year institution
   4. Update skills for a job currently held
   5. Interest and self-enrichment
   6. Other _____
      (Specify)

8. Was your goal as indicated in Question 7 achieved?

   1. Yes
   2. No

9-12. Evaluation of college and/or competencies student gained through attendance at the college. See discussion, page 38.

13. What is your current employment status? (Include self-employment and military as "employed.")

   1. Employed full-time (30 or more hours per week)
   2. Employed part-time (a minimum of 15 hours per week)
   3. Unemployed and seeking employment
   4. Homemaker, not employed outside the home
   5. Not employed and not seeking employment. (This response may apply to current students who do not seek employment.)

   If you are employed, whether full- or part-time, answer Question 14 through 19. If you have more than one job, respond about your primary job. If not employed, skip to Question 20.

14. In what geographic area are you employed?

   1. Within the _____ area
      Identify specific city, county or metro area the college serves

   2. Outside the _____ area
      Identify specific city, county or metro area the college serves

15. Describe your job:

   Job title _____

   Duties _____

   _____

16. Please indicate your approximate monthly salary rate (gross--before taxes and deducations):

   1. Up to $300
   2. $300-$399
   3. $400-$499
   4. $500-$599
   5. $600-$699
   6. $700-$799
   7. $800-$899
   8. $900-$999
   9. $1,000-$1,099
   10. $1,100-$1,199
   11. $1,200-Up

17. Is your present job related to the program you completed at

_____?
Name of Institution

1. Yes, directly related (go to Question 19)
2. Yes, closely related (go to Question 19)
3. Not related (go to Question 18)

18. If your job is not related to the program you completed at

_____, please indicate the principal reason why.
Name of Institution

1. Was already working with present employer before I completed the program
2. Not sufficiently qualified for a job in my field of preparation
3. Preferred to work in another field
4. Found better paying job in another field
5. Could not find a job in my field of preparation
6. Could not find a job in my field without relocating
7. Previously worked in field of preparation, but changed
8. Other _____
Specify

19. Evaluation of college preparation for job. See discussion, page 43.

20. Are you now enrolled in another institution of higher education?

1. Yes (Please continue with Question 22)
2. No (Please continue with Question 21)

21. Since leaving _____, have you been enrolled in another institution?
Name of Institution

1. Yes (Please continue with Question 22)
2. No (You have completed the questionnaire. Thank you.)

22. What best describes the type of institution you are now attending? (If you are not now attending, give the type of institution most recently attended.)

1. Four-year college or university in _____
Name of State
2. Technical school in _____
Name of State
3. Two-year college in _____
Name of State
4. Other _____
(Specify)

23. Evaluation of program for continuing education. See discussion, page 45.

24 and 25. Evaluation of transfer problems. See discussion, page 45.

26. If you are currently enrolled in an institution of higher education, please indicate your current enrollment status and classification at the college indicated in Question 22.

A. Status

1. Full-time student (12 hours or more)
2. Part-time student (less than 12 hours)

B. Latest classification

1. Freshman
2. Sophomore
3. Junior
4. Senior
5. Obtained a bachelor's degree
6. Other _____
(Specify)

27. What is your current major?

1. _____
(Specify)

2. No major declared

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Penny Proctor Noriega was born on July 20, 1953, in Tampa, Florida. She attended local public schools and graduated from Hillsborough High School in 1971. She continued her education at the University of South Florida where she received a BA degree in psychology in August of 1974. She next attended the University of Florida and obtained a BS degree in management in 1975 from the College of Business Administration. She was then admitted to the graduate program at the Institute of Higher Education, University of Florida. While working toward a graduate degree in higher education administration, she taught data processing at North Florida Junior College. She also worked as a graduate researcher with the Florida Community/Junior College Inter-Institutional Research Council. She received her Master of Arts in Education degree in 1977 and taught business courses for Central Florida Community College. While completing her doctoral program at the University of Florida in higher education administration, she worked as a Statistical Research Assistant for Hillsborough Community College. She resides in Tampa with her husband, Brian Noriega.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully acceptable, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully acceptable, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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